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# The Epitaph of a Royal Steward from Siloam Village

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THE inscription discussed here was discovered in 1870 by the famous French archaeologist Clermont-Ganneau in the course of his investigations at the village of Silwân (Siloam),[1] which stands near Jerusalem on the eastern scarp of the Kedron Valley, opposite the Hill of Ophel. About sixty metres south-west of the so-called 'Tomb of Pharaoh's Daughter', a small monolithic monument in Egyptian style standing at the northern approach to the village (Fig. 1), Clermont-Ganneau observed a rock-cut structure with a dressed façade 8 metres long and 4 metres high, running flush with the street and possessing an upper story of modern masonry (Fig. 2). Above the door of this rock-façade, which led into a rock-cut chamber 4.65×2.25 metres, he noticed a rectangular sunk panel, 1.32 metres long, with an engraved inscription consisting of three lines of Phoenician (ancient Hebrew) characters. To the right of the door, above a window-like opening, obviously of later work, another sunk panel was visible bearing an inscription of one line only.

Both inscriptions were badly damaged and appeared to Clermont-Ganneau to have been deliberately defaced with a hammer. The large panel was further

[1] In his first announcement of the discovery, made in *PEFQSt*, 1871, p. 103, Clermont-Ganneau did not disclose its whereabouts, as he had not yet secured his precious find. In *Archaeological Researches in Palestine*, I. London, 1899, p. 305 ff., he gives a vivid account of the circumstances of the discovery.

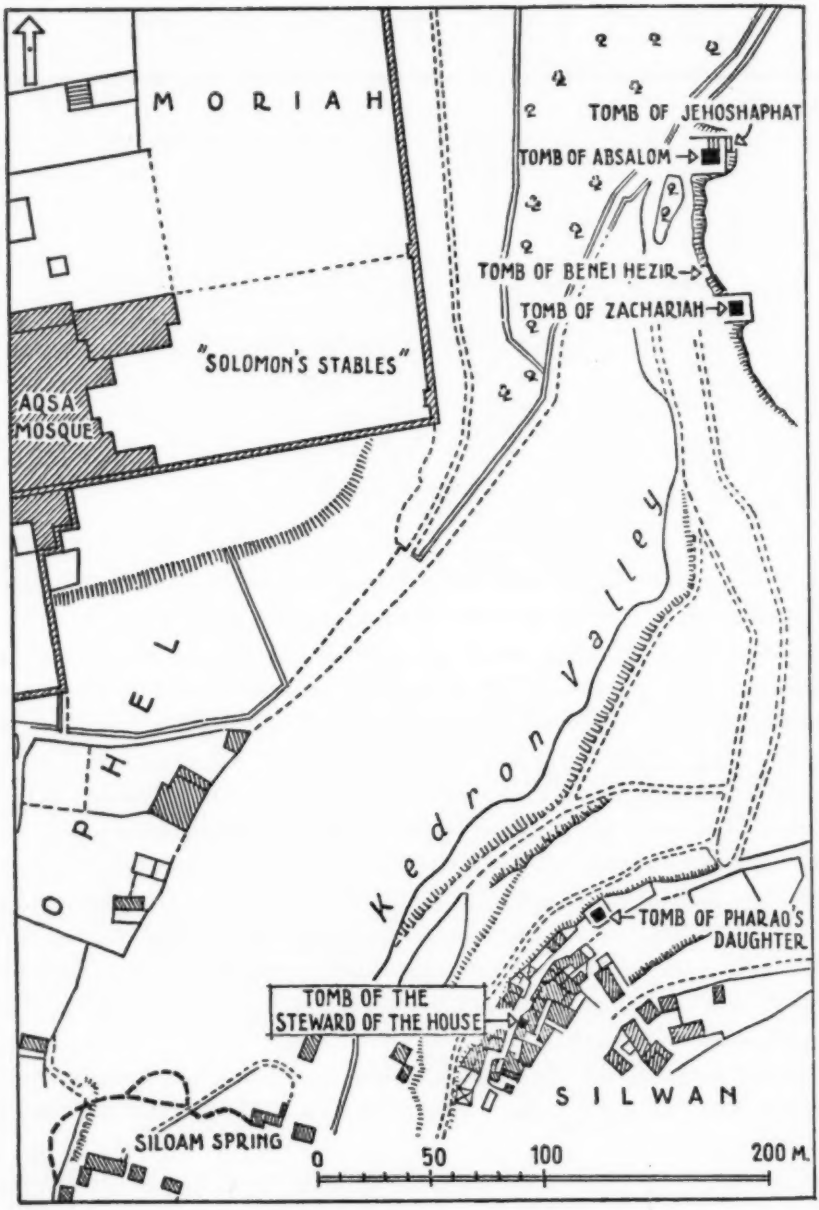


Fig. 1. General plan of the Kedron Valley monuments.

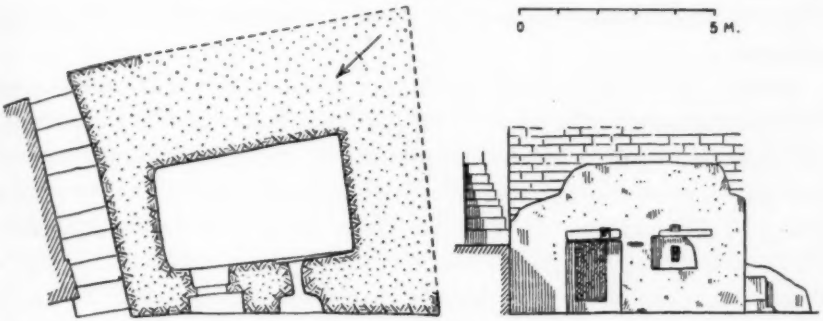


Fig. 2. Plan and elevation of the *Tomb of the Steward of the House.*

damaged by a large, deep square hole on the right-hand side, destroying a number of letters in each line. After attempting in vain to read the mutilated inscriptions, Clermont-Ganneau had them cut out of the rock and sent to London, where they are now on view at the British Museum.

Writing on the inscriptions some thirty years later, their discoverer admitted: 'The only word which I have been able to read, and that with absolute certainty, is the word בית, "house".' Assuming that the inscription belongs to a funerary monument, 'for it must not be forgotten that at Selwân we are in the great City of the Dead', he added: 'I hardly venture to say that I have sometimes conceived that this might be the tomb of Shebnah, or of one of his colleagues, for I fancied that I could read in the larger inscription the complete title אשר על הבית. But it is as well to be on one's guard against these too sanguine illusions'.[2]

Clermont-Ganneau postponed further discussion of this 'thorny subject', as he called it, 'waiting always for an opportunity to make the necessary verifications in London from the original stones', but nothing new on the subject appeared from his pen in the years that followed. Until the present day—more than eighty years after the discovery—no attempt to read these mutilated inscriptions has gone much beyond his proposed interpretation, apart from some suggested additional letters which give little or no sense.[3] Furthermore, neither a proper photograph nor a facsimile has been published to enable the scholarly world to check the soundness of Clermont-Ganneau's hesitantly proposed reading of the words אשר על הבית. Other scholars have in general accepted his interpretation, but

[1] *Ibid.*, p. 313, n.

[2] Cf. D. Diringer: *Le iscrizioni antico-ebraiche palestinesi.* Firenze, 1934, p. 107 ff. Pl. XIII, 2.

it may be noticed that very few have actually tried to tackle this 'hopelessly damaged inscription'.[4]

In this paper I shall discuss the large inscription only, having so far no definite proposal to offer for the reading of the smaller one.[5] Unfortunately, I have not been able to see the original, and the reading that follows is based primarily upon a thorough study of a squeeze kindly supplied by the British Museum.[6] Photographs of the original stone made by the same institution (Pl. 8)[7] and photographs taken from the negative paper squeeze and here reproduced in the positive, have also been helpful.[8] These photographs (Pls. 9A, 10) show clearly the lamentable condition of the inscription, its surface almost completely covered with depressions and deep hollows, which are here seen as projections. Fortunately there are very few deliberate scratches, so that nearly every line visible on the broken surface may be treated from the outset as a possible part of a letter—which in most cases it really is. A careful study shows that most of the characters are clearly traceable, while others are restorable with a high degree of certainty. In its main part, therefore, the inscription provides a certain and continuous reading (see drawing on Pl. 9 B).

I am aware of the disadvantage of being unable to compare the squeeze and photographs with the inscription itself, but I trust that more fortunate scholars will check the results of this study with the original text in London, and that they will comment on the suggestions offered here.

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[4] *Ibid.*, for further bibliography. The latest to mention it is J. Simons: *Jerusalem in the Old Testament*. Leiden, 1952, p. 198, n. 1, who writes: 'The reading of this much-damaged inscription, now in the British Museum, is impossible'.

[5] A good photograph of the smaller inscription is given in Diringer, *op. cit.* (supra, n. 3), Pl. XIII, 1.

[6] The writer takes this opportunity to thank all those who helped him to obtain the squeeze: the Trustees of the British Museum for kindly providing it, and for permission to publish both the squeeze and the photograph of the original inscription; Professor L. A. Mayer for his ready assistance; Mr. M. Dothan of Jerusalem and Mr. M. Gazith of the Israel Embassy, London, for their efforts in arranging the transport of the squeeze to Jerusalem; and above all, Mr. R. D. Barnett, Assistant Keeper of the Department of Egyptian and Assyrian Antiquities in the British Museum, who showed keen interest and was most helpful; were it not for his efforts, the present attempt to decipher this inscription could not have been made. Mr. Barnett was also kind enough to send the writer some remarks based on his observation of the original inscription. Due acknowledgement will be made in this paper wherever his opinions are quoted.

[7] The writer's thanks are due to Prof. A. Reifenberg and Dr. I. Ben-Dor for placing these photographs at his disposal.

[8] These photographs taken from the negative impression, by Mrs. H. Bieberkraut, Jerusalem, are here reproduced from reversed prints, giving the false appearence of the characters being in relief. The drawing of the inscription reproduced in Pl. 9 B is based on the squeeze, on photographs of the squeeze, and on the photograph of the original inscription.

In the following the proposed reading of the surviving text will be dealt with, line by line.

*Line 1.*

זאת (this is)—The first two letters are clearly visible and traces of the third may be distinguished.[9] The *âlef* was previously mistaken for a *qôf;* its peculiar shape will be discussed later (infra, p. 149). In the large lacuna which follows about seven letters are missing.

יהו...(...yahû)—The *yôd* is suggested by remnants of its upper part. The *he* and *waw* are well preserved.

אשר (who is)—The *âlef* is clear except for parts of the upper lines. The *šîn* is somewhat faint but quite certain. The long shaft of the *rêš* is fragmentary, its triangular head small and pointed.

על (over)—Both letters are clear. The shadow of the broken surface, seen under the *'ayin* on the photograph of the squeeze, may give the erroneous impression that this is a *bêt*.

הבית (the house)—These letters are very well preserved. The upper two lines of the *yôd* meet to form a triangle. The *taw* is followed by a dividing dot.

Thus far the reading יהו אשר על הבית... is obtained to the left of the lacuna.[10] The first three letters are generally supposed to be the end of the deceased's name, and the three following words his title: 'Steward of the House', as suggested by Clermont-Ganneau. The crux of this proposed reading is the large gap between the word בית and its article ה, the latter being close to the preceding *lamed* of על. Professor Mazar, with whom I discussed the inscription, is inclined to explain this phenomenon as a mistake on the part of the engraver, who copied the inscription from an original text written on parchment or papyrus. The first line of this may have ended with ה and the following letters בית have been written at the beginning of the next line—a common practice in ancient texts. When the engraver started to copy the second line, he mistook the letters for a separate word and wrote them far apart from the *he*. Another explanation is that the engraver spoiled a patch of stone when cutting the *he* and was therefore obliged to cut the *bêt* further away. The absence of a space before and after the word על is equally puzzling, especially as in the rest of the inscription the words are clearly spaced, with even the dividing dots still visible in some places. However, I have no sensible alternative to suggest regarding the division of words, and

[9] This reading was suggested independently by Mr. Barnett in a letter to the writer.

[10] Mr. Barnett reached the same reading when he examined the original inscription recently.

as the letters are certain, Clermont-Ganneau's interpretation may be regarded as solidly based.

אין (there is not)—The first two letters are very clear, the *âlef* being a well-preserved example of this peculiar shape. Of the third letter, only the curved stem is visible; the upper lines are obliterated by the break which follows. The letters *mem* or *nûn* are possible here, but only the suggested *nûn* gives a reasonable reading.

פּה (here)—Both letters are destroyed, and only tips of the *he* and the lower curve of the *peh* seem to be traceable. The suggested reconstruction is supported by the fact that there is no room for more than two letters.

כסף (silver)—All three letters are slightly damaged but clearly recognizable, both on squeeze and photographs. A dividing dot follows.

וזהב (and gold)—This word is partially damaged, but the reading may be regarded as quite certain. The first and last letters are clearly visible, while the upper stroke of the *zayin* and the upper part of the *he* establish their identity.

*Line 2.*

אם .. (but)—The first visible letter of this line on the portion of stone to the right of the square hole is an *âlef,* followed by a downward-sloping stroke which may represent any of the following letters: *kaf, mem, nûn* or *peh*. The *mem* here is suggested by the context. Before the *âlef* there is room for two more letters, but hardly a trace of them can be seen on the broken surface. These two letters will be discussed below, together with the missing letters of the large lacuna which follows.

ועצמת (and the bones)—The typical lines of the head of a *waw* can be distinguished at the left-hand edge of the square hole. The lower part of the *'ayin* is well preserved, the *ṣadê* is in perfect condition and the *mem* is clear. The stroke in the outer angle of its head, seen on the photograph, seems to be accidental. The *taw* was suggested by Mr. Barnett. The space it occupied is very broken, but the restoration seems reasonable.

אמתה (his slave-wife)—All the letters here are quite clear, only the upper zigzag lines of the *mem* being faint. The possessive suffix in אמתה (*his* slave-wife) is written with a *he* and not with the customary *waw*. This ancient form is found several times in the Bible: אהלה (Gen. ix, 21), סוחה, עירה (Gen. xlix, 11). It is used throughout on the Moabite Stone: בנה, בתה, ארצה; while in the Lachish Letters[11] it occurs in the noun עבדה (letter ii ,5) and in the verbs

[11] H. Torczyner: *The Lachish Letters.* London, 1938; *id.: The Lachish Ostraca.* Jerusalem, 1940 (Hebrew).

ידעתה (iii, 8), שלחה (iii, 21) and לקחה (iv, 6). The interpretation of the word אמתה will be discussed later.

אתה (with him)—Only the last letter is well preserved, the first two being suggested on the basis of very faint traces. Here too the suffix is *he* and not *waw*. A close parallel may be found in Lachish letter iii, 12: אתה (him).

ארור (cursed be)—All the letters are clearly visible, and are distinguished by their tall shafts. Note the *plene* writing here in contrast to the *defective* writing of the Siloam inscription.

האדם (the man)—The first two letters are clear, the *âlef* overlapping the *he*. The *dalet* is very worn, but one can follow the lines of the triangle with certainty. The *mem* is badly damaged, only faint traces of the upper lines being discernable on the photograph.

אשר (who)—Of the first letter only the vertical stroke is well preserved. The *šîn* is worn but quite certain, and the *rêš* very clear.

*Line 3.*

This line covers the last quarter of the panel, which was widened to include it.

יפתח (will open)—The *yôd* is damaged in part and the lower stroke is accidentally lengthened to the left. The *peh* is clear, but of the *taw* only traces seem to be visible. The *ḥet* is badly damaged, but the well-preserved left vertical stroke and other traces make this letter quite certain.

את—The first letter is well preserved, the second almost entirely destroyed.

זאת (this)—The first letter is in very good condition, the second is partly damaged and overlaps the *zayin*. Of the last letter only traces can be distinguished.

Summing-up the foregoing discussion we arrive at the following reading of the inscription:[12]

1. זאת [קברת ...]יהו אשר על הבית · אין פה כסף · וזהב
2. [כי] אם [עצמתו] ועצמת אמתה אתה · ארור האדם אשר
3. יפתח את זאת

1. This is [the sepulchre of ...]yahu who is over the house. There is no silver and no gold here
2. but [his bones] and the bones of his slave-wife with him. Cursed be the man
3. who will open this!

[12] Proposed restorations of missing parts, not discussed above, are given in square brackets.

The inscription may be divided into four distinct sections: (1) Identity of owner of tomb. (2) Statement that no valuables are within. (3) Contents of tomb. (4) Curse.

*Section 1.* The feminine demonstrative pronoun זאת must be followed by a feminine noun, here probably קברת (sepulchre of). This missing word (it is in the lacuna) is suggested by a comparison with another tomb-inscription discovered by A. Reifenberg at Silwân some years ago, a few houses' distance to the north of our tomb.[13] This inscription (Fig. 3), of which very little remains, starts with the word קברת, the construct form of קברה.[14] The feminine קברה occurs frequently in the Bible as a synonym for the masculine קבר, i. e. burial place: 'And Jacob set a pillar upon her grave (קברתה): that is the pillar of Rachel's grave (קברת רחל) unto this day' (Gen. xxxv, 20); '...and bury me in their burying-place' (בקברתם) (Gen. xlvii, 30). Of most of the kings of Judah it is said: they 'buried him in his sepulchre (בקברתו) with his fathers in the city of David' (2 Kings ix, 28; xxi, 26; xxiii, 30; 2 Chron. xxvi, 23).

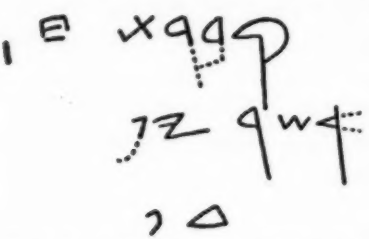


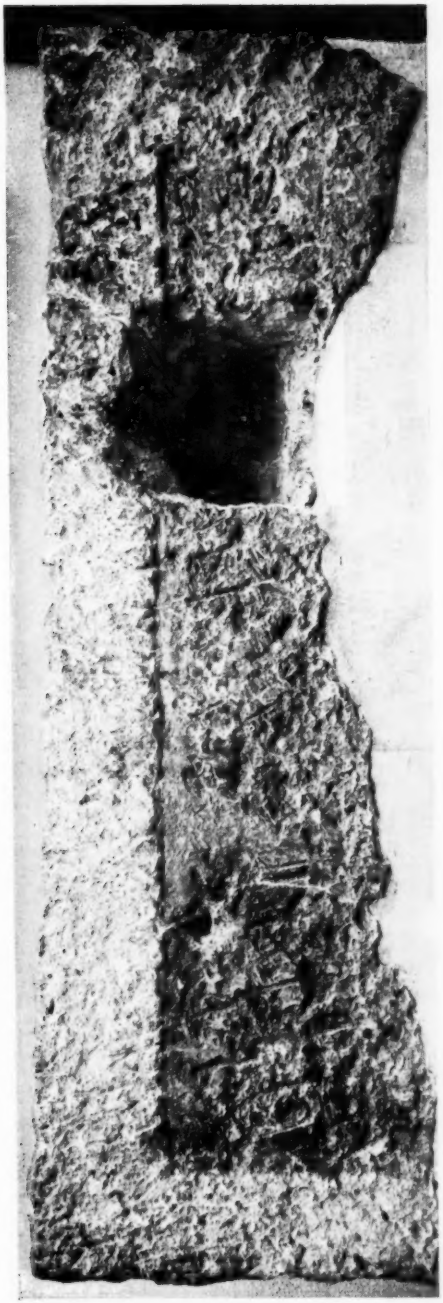
Fig. 3. Inscription found and published by A. Reifenberg.

The main interest of this section of the inscription lies in the title of the deceased: אשר על הבית ('He who is over the House'). This title, which may also be translated 'Steward of the House' or 'Governor of the Palace', indicates that the deceased was an official of high rank, holding a position of great importance at the court of the king.[15] Seven instances of this title are recorded in the Old Testament: (1) An anonymous figure who was in charge of the house of Joseph in Egypt—Gen. xliv, 1. (2) *Ahishar,* one of King Solomon's ministers—1 Kings iv, 6. (3) *Arza,* Steward of King Elah's house in Tirzah, the old capital of Israel—1 Kings xvi, 9. (4) *Obadiah,* in charge of Ahab's palace in Samaria—1 Kings xviii, 3. (5) *Jotham,* son of King Uzziah, who was 'over the House' during his father's illness—2 Kings xv, 5. (6) *Shebna,* Steward of the king's

[13] A. Reifenberg: A Newly Discovered Hebrew Inscription of the pre-Exilic Period, *JPOS,* 21, 1948, pp. 134-137.

[14] Now, in the light of our inscription, we may assume with certainty that Reifenberg's inscription was also preceded by the pronoun זאת, which the mutilation of the rock obscures.

[15] Cf. the *ša pân êkalli* and the *ša eli bîtâni* in Assyria. E. Ebeling & B. Meissner: *Reallexikon der Assyriologie.* Berlin & Leipzig, 1928, p. 464.



(By courtesy of the Trustees of the British Museum).

The original inscription.

PLATE 9



A: Squeeze of the inscription.



B: Drawing of the inscription.

1.32 m

A: Detail of centre of squeeze.

B: Left-hand part of squeeze.

A: General view of Siloam village showing vicinity of the *Tomb of the Steward of the House. Tomb of Pharaoh's Daughter* at middle left of picture.

B: Entrance to tomb, showing rock lintel from which the inscription was removed.

*(Photos A. Reifenberg)*

house under Hezekiah—Is. xxii, 15. (7) His successor *Eliakim,* son of Hilkiah —2 Kings xviii, 18; Is. xxxvi, 3. One more instance of the title occurs on a seal-impression discovered at Lachish, which bears the name גדליהו אשר על הבית.[16] The owner of this seal is generally identified with Gedaliah son of Ahikam, who was subsequently, after the fall of Jerusalem, appointed governor of Judah by Nebuchadnezzar—2 Kings xxv, 22. Gedaliah was assassinated at Mizpeh and apparently buried there.

As this brief survey shows, none of these names of officials seems suitable to restore the truncated name in our inscription. Either the names do not end with *-iah (=yahû),* or their bearers were not buried in Jerusalem. This interesting question will be considered again at the end of the present discussion.

*Section 2.* The meaning is obvious: a statement that neither silver nor gold is to be found in the tomb. For parallels in other inscriptions see below, p. 147.

*Section 3.* It is obvious that this should be the counterpart of the preceding negative statement and should indicate the actual contents of the tomb. The word 'but' may therefore be assumed at the beginning. This is obtained by restoring כי before אם. The expression כי אם is common in Biblical Hebrew as an expression of contrast, especially after a negation, and it also occurs in Lachish letter iv, 9.

The surviving text to the left of the large gap speaks of the bones of 'his slave-wife'. It is therefore most probable that in the lacuna the bones of the owner of the tomb himself were mentioned, and the reconstruction עצמתו 'his bones' hence seems very likely.[17] This word fits into the space of the lacuna perfectly and gives a sensible reading: '...but his bones and the bones of his slave-wife with him'.

The designation אמה in this context seems at first sight perplexing. Its ordinary meaning is: female slave, maidservant or slave-wife (concubine), the latter sense being frequent in the O. T. The Hebrew *amah* has a striking parallel in the ancient Babylonian *amtu,* and the word is common to all Semitic languages. How can we explain the burial of an *amah* in the same grave as her master?

The Book of the Covenant mentions a peculiar class of *amah,* namely the Hebrew free-born girl who was sold by her father into a specific kind of marriage—into slave-wifehood. This *amah* was inferior in position to a legally married wife,

[16] S. H. Hooke: A Scarab and Sealing from Tell Duweir, *PEFQSt,* 1935, p. 195 f.; S. Moscati: *L'epigrafia ebraica antica,* 1935-1950. Roma, 1951, p. 61 f.

[17] Independently suggested by both Prof. B. Mazar and Maj.-Gen. Y. Yadin.

but her rights were safeguarded by law (Ex. xxi, 7-11). Legally, the *amah* was a bondwoman, but in practice her rank in the household depended entirely upon the position her master wished to give her.[18]

The status of the *amah* in Biblical times has been briefly discussed elsewhere by the writer in a study of a seal bearing this designation.[19] It was there shown that 'a favourite *amah* who bore children to her master could outrival the principal wife and rise to the rank of a married woman'. According to a later source, the Talmud, a concubine was in some circumstances considered as married.[20] It is therefore not inconceivable that a man should arrange to be buried with his beloved *amah,* who was his wife in every respect despite her lack of freedom. One has to admit, however, that it is surprising.[21] The mention of the *amah* here may indicate that the inscription was prepared in the lifetime of the owner. It is well known that in ancient times men often prepared their own sepulchres (cf. Is. xxii, 16).

*Section* 4. This section which ends the inscription contains the curse. The use of האדם is somewhat astonishing in this phrase—one would expect האיש instead. (Cf. Deut. xxvii, 15: ארור האיש אשר יעשה פסל ומסכה.) However, the proposed reading seems quite certain, and as we shall see later, the use of אדם is common in comparable Phoenician inscriptions. From the point of view of expression, the phrase 'will open this' seems incomplete. One feels the need of the word

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[18] For detailed studies on this subject see: N. Neufeld: *Ancient Hebrew Marriage Laws.* London, 1944, pp. 68 ff, 118 ff; L. M. Epstein: *Marriage Laws in the Bible and the Talmud.* Cambridge, Mass., 1942, Chapter II: Concubinage; I. Mendelsohn: *Slavery in the Near East.* New York, 1949; G. R. Driver & J. C. Miles: *The Babylonian Laws,* I. Oxford, 1952. In the last-named book (p. 305) an interesting document is quoted, in which 'a slave-girl who has been bought by a married couple is described as the "wife" (Bab. *aššat*) of the man and the "slave" (Bab. *amat*) of the woman'.

[19] N. Avigad: A Seal of a Slave-wife (Amah), *PEQ,* 1946, pp. 125-132, where the author explained the word *amah* on the seal as 'slave-wife'. It was subsequently suggested (by W. F. Albright apud H. L. Ginsberg: Judah and the Trans-Jordan States from 734 to 582 B.C., *Alexander Marx Jubilee Volume,* New York, 1950, p. 356, n. 33), that *amah* might be the female equivalent of the designation often found on seals *'ved,* viz. an official. The occurrence of *amah* in our tomb-inscription seems to eliminate this possibility.

[20] "אשה יש לה כתובה ושגאי כתובה, מלגש יש לה כתובה ואין לה שגאי כתובה" 'The wife has a marriage-contract containing the conditions of a marriage-contract; the concubine has a marriage-contract but without the conditions of a marriage-contract.' (Palest. *Ketûbôt* 29 d). Cf. Neufeld, *op. cit.* (supra, n. 18), p. 124, n. 2.

[21] A different opinion, worthy of notice, was expressed to the writer by Maj.-Gen. Y. Yadin. In his view, the designation *amah,* both on the above-mentioned seal and in our inscription, applies to a legally married wife and not to a slave-wife, that is to say, אמה equals אשה. Mr. Yadin observes that in Assyrian literary sources Zakûtu, the wife of Sennacherib, king of Assyria, is referred to as the *amtu* of Sennacherib. Cf. Hildegard Lewy: Nitokris Naqî'a, *JNES,* 11, 1952, p. 282, n. 92.

קברה, which would give the reading את הקברה הזאת 'this sepulchre'. The omission of קברה may simply be due to lack of space. The last word זאת evidently refers back to the זאת with which the inscription begins.

The contents of our inscription and the formulae used therein find abundant parallels in the sepulchral inscriptions of the ancient world. Ancient tombs, especially those of nobles, were always suspected of containing valuable objects buried with the dead, and were despoiled by conquerors and ordinary tomb-robbers from very early times. As a preventive measure, assurances that nothing of value was within were included in tomb-inscriptions, with curses and threats upon the would-be robber.

The following are some outstanding parallels:

The Aḥiram inscription (11th century B. C.)[22] is the oldest known Phoenician tomb-inscription to contain curses upon any man who lays bare the sarcophagus.

In an Aramaic inscription, almost contemporary with ours (7th century B.C.), Agbar, priest of Sahar in Nêrab (Syria), declares:[23]

> '...And they did not lay with me any vessel of silver or bronze; with my shroud they laid me, so that for another(?) thou shouldest not plunder my couch. Whosoever thou art that shalt injure and plunder me, may Sahar and Nikal and Nusk make his (sic) death miserable, and may his posterity perish!' (Cooke, No. 65).

The closest parallel in language and phraseology is provided by a 5th-4th century B.C. Phoenician inscription from Sidon, engraved on a sarcophagus:

> 'I Ṭabnit, priest of 'Aštart, king of Sidonians... lie in this coffin. My (curse be) with whatsoever man (כל אדם) thou art that bringest forth this coffin! Do not, do not open me nor disquiet me, for I have not indeed(?) silver, I have not indeed(?) gold nor any jewels of... only I am lying in this coffin. Do not, do not open me nor disquiet me for that thing is an abomination to 'Aštart. And if thou do at all open me and at all disquiet me, mayest thou have no seed among the living under the sun, nor resting-place among the shades!' (*ibid.*, No. 4).

Another Phoenician inscription, engraved on the sarcophagus of Ešmun-âzar, king of the Sidonians, son of the Ṭabnit mentioned above, says *inter alia:*

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[22] R. Dussaud: Les inscriptions phéniciennes du tombeau d'Aḥiram, roi de byblos, *Syria*, 5, 1924, pp. 135-137; W. F. Albright: Notes on the Early Hebrew and Aramaic Epigraphy, *JPOS*, 6, 1926, pp.75-102; N. Sloushz: *Thesaurus of Phoenician Inscriptions*. Tel-Aviv, 1942, No. 1 (Hebrew).

[23] For the convenience of the English reader, the translations which follow are taken from G. H. Cooke: *A Textbook of North Semitic Inscriptions*. Oxford, 1903, although some details of his version may be debatable. For Hebrew translations, see Sloushz, *op. cit.* (supra, n. 22).

'...and I lie in this coffin and in this grave in the place which I built. I adjure every prince and every man (כל אדם) that they open not this resting-place, nor seek with me jewels, for there are no jewels with me there... For every prince and every man who shall open this resting-place... may they have no resting-place with the shades, nor be buried in a grave, nor have son or seed in their stead...' (*ibid.*, No. 5).

The inscriptions cited above are similar in structure and phraseology to ours, containing as they do the identity of the deceased and an affirmation that no valuables are within the tomb but only his body, after which comes a request not to open the tomb, and a curse.

Four ancient Hebrew tomb-inscriptions are at present known to exist, including the one which is the subject of this paper.[24] Their condition, however, is so fragmentary that we have hitherto been ignorant of their original contents, and our inscription of 'the Steward of the House' is in fact the first to yield the text of a Hebrew tomb-inscription from the period of the Kings.

It may be assumed that other Hebrew tomb-inscriptions of that period were written in similar fashion. In the fragmentary inscription discovered by Reifenberg (mentioned above), where only two words and some isolated letters survive, the first line begins, as we have seen, with the word קברת (sepulchre of), while the second contains the letters ...אשר ים, which may now be restored with certainty אשר יפתח (who will open). That is to say, this inscription too contained a curse upon the opener of the tomb—and most probably other phrases resembling those of our inscription.

Later tomb-inscriptions follow ancient tradition: in Jewish tombs from the last two centuries of the Second Temple inscriptions are found prohibiting the opening of the tomb or the bone-receptacle. These inscriptions, written in Aramaic, end with the short formula ולא למפתח 'and not to be opened'. The most famous example is the Uzziah inscription: 'Hither were brought the bones of Uzziah, king of Judah, and not to be opened.'[25] Above the blocked opening of a *loculus* the following words were found painted: 'This *loculus* was made for the bones of our fathers, length two cubits, and not to be opened upon them'.[26] A stone slab which had covered the opening of the *loculus* bore the words '...and not to be opened for ever'.[27]

[24] Three of them were discovered by Clermont-Ganneau and one by Reifenberg.

[25] E. L. Sukenik: Funerary Tablet of Uzziah, King of Judah, *PEFQSt*, 63, 1931, pp. 217-221.

[26] E. L. Sukenik: A Jewish Tomb in the Kedron Valley, *Tarbiṣ*, 6, 1935, pp. 190-196 (Hebrew).

[27] Sukenik, *op. cit.* (supra, n. 26), p. 195; *id.*: Verschlusstein mit Inschrift aus einer Grabhöhle bei Jerusalem, *ZDPV*, 55, 1932, pp. 124-128.

A similar formula is found in a Palmyrene sepulchral inscription of the 2nd-3rd centuries A.D.:

> '...and let no man open over him this niche for ever! Let him have no seed or fortune for ever, nor let there be any prosperity for him who shall open it, for ever' (Cooke, No. 145).

This tradition survived into the Arabic period. Especially worthy of notice is an Arabic tomb-inscription of 937 A.D., found in Jerusalem.[28] It ends with a curse most similar to that of our inscription of the Steward of the House: 'Cursed be the one who will tread upon or will open this grave!'. Van Berchem remarks that curse-formulae occur only in such of the Arabic tomb-inscriptions as were found in Jerusalem —the tradition is said to be a local one. It may be observed that all the Hebrew and Jewish-Aramaic tomb-inscriptions mentioned above were found in Jerusalem.

The palaeography of the Siloam tomb-inscription presents some very interesting features. The script as a whole is similar in style and form to the Siloam tunnel inscription, but it is less flowing and exhibits certain peculiarities (cf. Fig. 4).

The *âlef* is of a unique and hitherto unknown shape. At first sight it looks like a *qôf*, but no *qôf* of this exact form is to be found in Hebrew epigraphy. It seems to be derived not from the ordinary *âlef* 𐤀 but from the later form 𐡀. The two horizontal lines join in an angle to the left of the vertical shaft 𐡀, and the addition of the sloping stroke to the right 𐡀 forms a large triangle, which makes the letter look like a *qôf*. It is hard to explain this strange deformation of the *âlef*, which has no parallel in other inscriptions. We can only wonder at the creative spirit of the writer and regard this form as an individual cursive —one of the curiosities of Hebrew palaeography.

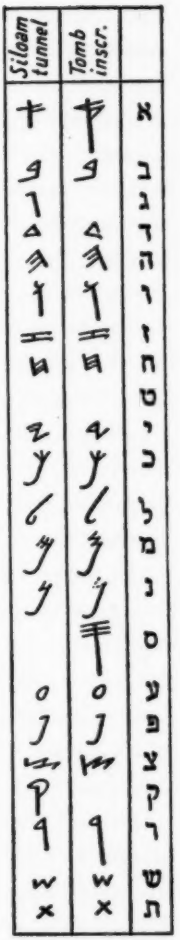

Fig. 4. Comparative alphabets.

The second peculiar letter is the *yôd*, which has a triangular head formed by the junction of the two otherwise parallel lines to the left of the vertical stem.

The remaining letters have no unusual features. The *mem* unlike that of the

[28] M. van Berchem: *Corpus Inscriptionum Arabicarum*. Jérusalem Ville, I, 1. 1922, No. 7.—I have to thank Mr. U. Ben-Horin for this reference.

Siloam inscription, has the earlier form of the zigzag head. The *rêš* in the first line has a distinctly pointed triangular head, in contrast to the rounded heads of the same letters in the second line. The vertical shafts of the letters *âlef*, *waw* and *rêš* are distinguished by their unusual height: they are longer than the comparatively tall equivalent letters in the Siloam inscription. It is noteworthy that a similar long-stemmed *rêš* is preserved above the entrance to the monolithic monument known as the 'Tomb of Pharaoh's Daughter', in the vicinity of our tomb.[29] Long stems are a characteristic feature of the classical Hebrew cursive writing of the eighth and seventh centuries B.C.

The pre-Exilic date of the inscription is evident. The *terminus ante quem* is provided by the title אשר על הבית, the use of which would be anachronistic after the fall of Jerusalem in the year 586. Palaeographically, as we have said, the characters of our inscription are most closely related to those of the Siloam tunnel inscription, with the few exceptions mentioned. In so far as palaeography can be considered a safe criterion in dating, the two inscriptions may be regarded as approximately contemporary, i.e. from about 700 B.C. On the other hand it may be argued against this synchronism that the writing in the Siloam inscription is *defective* throughout, whereas in ours the word ארור is written *plene*, which according to the generally accepted opinion is a later practice.[30] By this argument the Siloam inscription should provide a *terminus post quem* for ours, whose date would then be lowered considerably. However, our knowledge in this respect is too limited by lack of epigraphical material for any definite conclusions to be drawn.

The real clue to the date of the inscription lies in the name of the official, provided that he is known from the Bible. The restoration of a name ending with *-yahû* is, of course, a matter of guesswork, since we may assume that other officials whom the Bible does not mention also bore the title אשר על הבית and also had names ending in *-yahû*. But one possible restoration, suggested by Maj.-Gen. Yadin, should be mentioned here, *viz.*: יהו[שבנ] = [Šeban]yahû, which is the full form of the name שבנא = Šebnâ. It would be premature to draw any conclusion from a highly conjectural suggestion, but the associations evoked by this name are fascinating enough to merit a short excursus.

It is a well-known fact that certain Hebrew names, ending on *âlef* such as

[29] Cf. Diringer, *op. cit.* (supra, n. 3), Pl. XII, 2.

[30] The author is indebted to Prof. Tur-Sinai and to Mr. J. Kutsher for various remarks of interest when discussing this subject.

אחא, עזרא, עבדא etc. are hypocoristica of אחיהו, עזריהו, עבדיהו etc.[31] Both in the O.T. and on Hebrew seals we find שבנא as well as שבניה or שבניהו.[32] A person could apparently be called both by his full name and by its abbreviation.[33] Now, the proposed reconstruction of the mutilated name [Šeban]yahû on the inscription, together with the title that follows, reminds one of the prominent Biblical figure שבנא אשר על הבית 'Shebna who is over the House', whose tomb is mentioned in a famous prediction by Isaiah (xxii, 15-16):— "כה אמר אדני יהוה צבאות, לך בא אל הסכן הזה על שבנא אשר על הבית: מה לך פה ומי לך פה כי חצבת לך פה קבר חצבי מרום קברו חקקי בסלע משכן לו". 'Thus saith the Lord GOD of hosts, Go, get thee unto this treasurer, even unto Shebna, which is over the house, and say, what hast thou here, and whom hast thou here, that thou hast hewed thee out a sepulchre here, as he that heweth him out a sepulchre on high, and that graveth a habitation for himself in a rock?'

It is possible to point out certain affinities between this passage and the archaeological evidence of both inscription and tomb. In both cases the owner of the sepulchre bears the title אשר על הבית. Šebnâ lived in the reign of Hezekiah, which corresponds to the date of our inscription as approximately fixed by palaeography. The prophet Isaiah rebuked Šebnâ for hewing himself a tomb in the high rock which apparently caught the eye from a distance. The tomb under discussion here was also apparently hewn in the lifetime of its owner: it is, moreover, not the usual subterranean rock-chamber, but a rock structure exposed to the view (and perhaps even originally crowned by a pyramid). To the observer looking from the Kedron Valley up to the rocky cliffs of Siloam village, it might well have appeared as 'a sepulchre on high'. Isaiah's peremptory query "מה לך פה ומי לך פה?" — 'What hast thou here, and whom hast thou here?' is interpreted by some exegetes to mean that Šebnâ was a foreigner,[34] and by

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[31] M. Noth: *Die israelitischen Personennamen*. Stuttgart, 1928, pp. 36 ff.

[32] Diringer, *op. cit.* (supra, n. 3), Index; Moscati, *op. cit.* (supra, n. 16), Index. Cf. also Albright's remarks concerning the forms of this name in *BASOR*, 79, 1940, p. 29, n. 1.

[33] The 'garden of Uzza' in 2 Kings xxi, 18, 26, is generally believed to be named after King Uzziah. The Levite עבדא בן שמוע in Neh. xi, 17, is called עבדיה בן שמעיה in 1 Chron. ix, 16. One of the 'chief men' in 1 Chron. viii, 31, זכר is called זכריה in the next chapter (ix, 37). Ahaz, the king of Judah, is mentioned on Assyrian monuments as Yauḥazi, which corresponds to יהואחז, the full form of אחז. Cf. *The Westminster Dictionary of the Bible*. London-New York, 1944, s. v. Ahaz; *Encyclopaedia Biblica*, I. Jerusalem, 1950 (Hebrew), s. v. אחז.

[34] The views of commentators are divided as to whether Šebnâ was a foreigner in the king's service, or an Israelite and as such regarded a stranger in Judah. Cf. R. David Kimḥi and various modern commentators.

others that he was a parvenu of low origin who dared to erect his tomb among the tombs of the nobles.[35] It is of interest also that Šebnâ is the only official in the O.T. to be called סכן, whereas this word is a common Phoenician synonym for 'governor'.[36] In the light of the former interpretation, the somewhat surprising occurrence of *amah* and the Phoenician-style formula of our inscription could be regarded from a different angle. But this would lead us too far into discussion of a matter which, after all, is based on conjecture alone.

Whatever the name of the owner of the tomb, he was without doubt one of the king's ministers, and his sepulchre stands in the midst of a necropolis where persons of rank and high distinction were laid to rest.[37]

The inscription discussed here is, in the words of its discoverer, the first 'authentic specimen of Hebrew monumental epigraphy of the period of the Kings of Judah',[38] for it was discovered ten years before the Siloam tunnel inscription. Now, after its decipherment, we may add that it is (after the Moabite Stone and the Siloam tunnel inscription) the third longest monumental inscription in Hebrew and the first known text of a Hebrew sepulchral inscription from the pre-Exilic period.

[35] G. B. Gray: *The Book of Isaiah*, I. The International Critical Commentary, Edinburgh, 1949, p. 371 f.

[36] *Corpus Inscriptionum Semiticarum*, I, 5; Sloushz, *op. cit.* (supra, n. 22), Nos. 1, 58 A. Cf. also the *sûkinu-râbiu* of the el-Amarna letters: J. A. Knudtzon: *Die El Amarna Tafeln*, II. Leipzig, 1915, No. 256, 9.

[37] Some of these tombs are dealt with in the author's forthcoming book *Ancient Monuments of the Kedron Valley* (Hebrew).

[38] Clermont-Ganneau, *op. cit.* (supra, n. 1), I, p. 305.

# The Land of 'Amqi*

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THE land of 'Amqi occurs several times in the el-Amarna letters and in Hittite inscriptions contemporary with them. This district in the north of Canaan is generally identified with the valley of the Lebanon.[1] But, as we will see further on, the land of 'Amqi was a well defined geographical and political unit, which cannot possibly be identified with the whole of the long valley-region between Lebanon and Antilebanon. The origin of the name 'Amqi is indeed derived from the Semitic word עמק, i. e. valley, which appears in ancient records as a geographical term referring to other valleys in Canaan also.[2] But 'Amqi has become here the name of a definite region, and is mentioned together with other political entities, such as the land of Upe (Damascus)[3] etc. Similarly, the Antioch Plain on the Orontes ('Amûq) is known in Assyrian inscriptions by the name of Unqu.

In defining more closely the area under consideration, which is the purpose of this paper, we are helped by the fact that we know from the el-Amarna letters several names of cities in the land of 'Amqi and its vicinity, names which also occur in the inscriptions of Thutmosis III and Amenhotep II. The exact determination of the land of 'Amqi and its cities may therefore not only throw further light on the relations between the Hittites and the Egyptians, who contended for domination over the land of 'Amqi, but may also assist in the clarification of some historical and topographical problems connected with the interpretation of the Egyptian lists.

Among the el-Amarna tablets we have four letters, written by the rulers of

* The author's thanks are due to Prof. B. Mazar-Maisler and Mrs. Ruth Amiran for having read the manuscript and made valuable suggestions, to Mr. S. Yeivin for correcting the spelling of some of the Arabic names, and to Mr. H. Tadmor-Frumstein for examining the Akkadian texts.

[1] See e.g. O. Weber, apud J.A. Knudtzon: *Die El Amarna Tafeln.* 2 vols. Leipzig, 1907-15 (hereafter abbreviated EA), Ref. II, p. 1112; F.-M. Abel: *Géographie de la Palestine,* II. Paris, 1938, p. 7, carte I; G. E. Wright: *The Westminster Historical Atlas to the Bible.* London, 1946, p. 107, Pl. III; A. Goetze apud J.B. Pritchard: *Ancient Near Eastern Texts.* Princeton, 1950 (hereafter abbreviated *ANET*), p. 395.

[2] J. Simons: *Handbook of Egyptian Topographical Lists.* Leiden, 1937, p. 118, No. 107; p. 183, No. 65.

[3] EA 53.

different cities in the land of 'Amqi:[4] Bieri of Ḫašabu (EA 174), Andaya of Ḫazi (EA 175), Abdi-riša of Ešazi[5] (AO 7097) and a fourth, where the name of the ruler and of the city are both illegible (EA 176). The formulation and language of these four letters are identical word for word, and there can be no doubt that all four letters were written by neighbouring towns, acting in concert.[6] The four kings ask for Egyptian help against Edaqama, king of Qadeš (Tell Nebi Mind on the Orontes),[7] who had made common cause with the Hittites in their attack against the country of 'Amqi: 'Behold, we are in Amki, cities (ana $^{mâtu}$ Amki alâni) of the king, my lord, but Edaqama, the man of Kinza (Qadeš), is gone towards the soldiers of Ḫatta and he has set fire to the cities of the king, my lord.'

The land of 'Amqi and its cities are mentioned also in other letters of el-Amarna, and—remarkably enough—always in connection with the Hittite attack in alliance with the king of Qadeš.

In EA 170 Ba'aluia and Batti-ilu write to the king[8] that 'soldiers of Ḫatte and Lupakku[9] have taken cities of Amki, and of the cities of A-ad-du-mi they have captured'.

In EA 140 Ilirabiḫ of Gubla (Byblos) accuses Aziru of rising against Egypt and attacking various towns in Syria. Further on he accuses Aziru: 'He has sent people to support Itakama and he has smitten all the lands of Amki, lands of the king, and now he has sent his people to conquer the lands of Amki and (its?) places (mâtâti Amki ù ašrâti)'. The letter ends with accusations against the kings of Ḫatta and of Mitani (Narina).

EA 173—this letter too deals with an attack on 'Amqi, but the text is incomplete and further particulars are missing.

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[4] The quotations of the el-Amarna texts are according to the Knudtzon edition (supra, n.1); the tablets of the *Antiquités Orientales du Louvre*, published by F. Thureau-Dangin, *Rev. d'Assyriol. & d'Archéol. Orient.*, 19, 1922, pp. 91-108, are quoted according to the edition of S. A. B. Mercer: *The Tell el-Amarna Tablets*. 2 vols. Toronto, 1939.

[5] Prof. B. Mazar suggests that we may also read Bît-šazi, a more plausible name.

[6] Weber, *op. cit.* (supra, n.1), p. 1276, supposes correctly that they seem to be written by one scribe.

[7] The name of the king of Qadeš appears in various letters in different forms: Etakkama, Aitugama, Etagama, Etaqkama, Ataqqama, Itaqkama; see Weber, *op. cit.* (supra n.1), p. 1284 ff; 1560. In the three letters of the Knudtzon edition (EA 174, 175, 176) the name is not complete and therefore Knudtzon completes 'Edagama'. But the fourth letter (AO 7097) shows that the correct reading in these letters is Edaqama. Mr. H. Tadmor remarks that in the Hittite inscriptions the name is Aitaggama.

[8] The king in this letter is probably Aziru, the son of Abdi-aširta, king of Amurru, and Ba'aluia and Batti-ilu are his brothers; see Weber, *op.cit.* (supra, n.1), p. 1273 f.

[9] Lupakku is the Hittite commander, see further on.

In EA 53 Akizzi of Qaṭna asks for the help of Egypt, for Aitugama and the king of Ḫatte are attacking him and he is in great danger. He also reports that the king of Qadeš in alliance with the kings of Lapana[10] and of Ruḫizzi,[11] is engaged in an attack on the land of Upe (Damascus). Further on he warns the king of Egypt that the land of Upe will no longer belong to him if the kings of Lapana and Ruḫizzi shall remain and sit (i.e. rule) in the land of Am[k]i.

The contents of this letter, which deals again with an attack by the king of Qadeš, prove that the completion of Am[.]i to Amki is certainly correct. Daša seems to be the same as Taššu in EA 56, 16.[12] That letter too, which is very fragmentary, deals with a military expedition of Taššu, in alliance with Ataqqama and with the people of Ruḫizzi.

It is therefore clear that all the el-Amarna letters connected with the land of 'Amqi deal with the same event: the Hittite attack on 'Amqi in alliance with the king of Qadeš. That we have here a definite historical event is surprisingly confirmed by the Hittite texts, from which we learn also further details about the land of 'Amqi.

In the Annals of Šuppiluliuma, compiled by his son Muršiliš, we are told about the famous request of the Egyptian queen, made after the death of her husband, to marry one of the sons of Šuppiluliuma. We are told that this request, which seems to have been intended to appease the Hittites, came after a Hittite attack on 'Amqa. Muršiliš says: 'While my father was down in the country of Karkamiš, he dispatched Lupakkiš and Tešub-Zalmas to the country of 'Amqa. They proceeded to attack the country of 'Amqa and brought deportees, cattle (and) sheep home before my father. When the people of the land of Egypt heard about the attack on 'Amqa, they became frightened...'[13]

There can be no reasonable doubt that the Hittite commander Lupakkiš, whom Šuppiluliuma sent to attack the country of 'Amqa, is identical with Lupakku of EA 170, who was accused of taking towns in the land of 'Amqi with Hittite troops.[14] In any case it seems obvious that all the above mentioned el-

[10] Lapana (Labana) is לבנה (חמת) of the O.T., identified with Labwe on one of the sources of the Orontes, 40 km. S of Qadeš; see Weber, *op. cit.* (supra, n.1), p. 1111; B. Mazar-Maisler: Levô' Ḥamât and the Northern Boundary of Canaan, *BJPES*, 12, 1946, pp. 91-92 (Hebrew).

[11] Ruḫizzi, which occurs also in the inscriptions of Ramses II, is mentioned in the el-Amarna letters always together with Lapana and must be located in its vicinity.

[12] Weber, *op. cit.* (supra n.1), p. 1117, considers his idenfication with Biridašwa of EA 197, 15.

[13] Goetze, *ANET*, p. 319.

[14] E.O. Forrer: *Forschungen*, II, p. 24-25; Sidney Smith: Amarna Letter 170 and Chronology, *Halil Edhem Volume*, I. Ankara, 1947, pp. 33-43. In the continuation of the letter there occurs the name of Zitana, also a Hittite commander, known from the Hittite documents as Zitas; see Smith, *op. cit.*, p. 40.

Amarna letters deal with that Hittite invasion in the days of Šuppiluliuma.[15]

The attack on 'Amqa is also mentioned in the 'plague prayers of Muršiliš'.[16] Muršiliš searched for the sins which had caused the terrible plague in his days. Among others he accuses his father of breaking the oath of the gods, by violating the treaty with Egypt and attacking Amka: '...the people of Hatti and the people of Egypt had been placed under oath by the weather-god of Hatti, then the people of Hatti committed a volte-face (?) and there and then they violated the oath of the god, and my father sent infantry and chariotry, and they invaded the *border-land of Egypt, the land of Amka,* and again he sent them and again they invaded...'

Hence we must look for the land of 'Amqi on the border between Egyptian territory and the Hittite Empire of Šuppiluliuma. The attack on 'Amqi not only frightened the Egyptians, in the eyes of the Hittites too it was a manifest invasion of Egyptian territory. We know that Hittite rule reached south to Qadeš; from there they several times invaded the region of Damascus.[17] The Hittite-Egyptian treaty in the days of Ramses II also fixed the border south of Qadeš, and even in the O.T. the northern border of the Egyptian province of Canaan is mentioned as—לבא, i.e. Labwe south of Qadeš.[18] The el-Amarna letters and the Hittite texts therefore indicate that we should look for the land of 'Amqi south of Qadeš, Lab/pana (לבא) and Ruḫizzi, but not very far from them.

A detailed study of the city-names mentioned in 'Amqi and in its vicinity gives us further information. Besides the above-mentioned letter of Andaya, king of Ḫazi (EA 175), there are among the el-Amarna tablets two letters of Mayarzana, king of Ḫazi.[19] In the first of these (EA 185) he accuses Amanḫatbi, king of Tušulti, of helping the Ḫapiru to conquer and burn four cities: Maḫzibti, Giluni, Magdali and Ušte. When they also attacked Ḫazi itself, they were beaten off by Mayarzana and some of them found refuge in Tušulti. In this connection we hear about another city, Paḫmi, but the text is incomplete and its association with these events is not clear.

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[15] Without entering into the chronological discussion whether these happenings are connected with the death of Amenhotep IV or Thut-anch-amon, attention should be given to the fact that all the above mentioned EA letters, which deal with the Hittite attack on 'Amqi, must be from that time.

[16] E.O. Forrer, *PEFQSt*, 1937, p. 105; Goetze, *ANET*, p. 395; O.R. Gurney: *The Hittites*, (Penguin ed.), 1952, p. 61. [17] Forrer, *op. cit.* (supra, n.16), p. 102. [18] Mazar-Maisler, *op. cit.* (supra, n. 10).

[19] We may suppose that Mayarzana is a predecessor or perhaps the father of Andaya, because from a comparison with the Hittite texts it becomes clear that the letters connected with the attack on 'Amqi belong to the latest period of el-Amarna.

The second letter (EA 186)—which in its greater part resembles the first word for word—deals apparently with the devastation of the same four cities. Although the names of the cities are not legible in this letter, Knudtzon's completion of the name in line 14 to T[ušul]ti is incomprehensible. If this were correct we should have to assume that the Ḫapiru destroyed with the help of the king of Tušulti—Tušulti itself. There can be no doubt that the correct version is M[aḫzib]ti. The names of the second and fourth cities are illegible. Of the name of the third city only the ending is legible, and that not with certainty:... šega. If this is the correct reading, it may be supposed that the name Magdali here receives a special determinant, as is usual with the common name מגדל.

To sum up our information thus far, we know the names of nine or ten cities: Ḫašabu, Ḫazi, Bît-šazi (Ešazi) and an unknown city (whose name may be among the six other names) in the land of ʿAmqi itself; and in its near vicinity the cities of Tušulti, Maḫzibti, Giluni, Magdali, Ušte and Paḫmi, which are mentioned in the letter of Mayarzana, king of Ḫazi.

Three of these cities, *viz.* Ḫazi, Ḫašabu and Tušulti, also occur in the inscriptions of Thutmosis III and Amenhotep II. From the list of Thutmosis we cannot determine their exact situation; yet their identification is of great importance for the correct understanding of the list. As Ḫašabu and Tušulti are mentioned by Thutmosis one after the other, there can be no doubt of their identity with the synonymous cities of ʿAmqi, which the EA letters also mention in connection with each other. Therefore the proposals to locate these cities in various parts of Palestine cannot be accepted, e.g. in the Negev as suggested by Noth, or in the Jordan Valley south of Tiberias, as suggested by Yeivin.[20]

We may glean more particulars about Ḫašabu and the land of ʿAmqi from the description of the first campaign of Amenhotep II.[21] The first and only city in Canaan where the Pharaoh met with resistance was šmš ltm=שמש אדם, apparently Bêt Šemeš of Naphtali, which must be looked for in eastern Galilee, on the main road from the valley of Megiddo to the northern Jordan Valley.[22] From there the Egyptian army continued northwards, crossing the

[20] M. Noth, *ZDPV*, 1938, pp. 48-49; S. Yeivin, *EI*, 3, 1953, p.34 (Hebrew).

[21] For a detailed study of this campaign and its bibliography, see the article by B. Mazar: The Canaan-Expeditions of Amenhotep II, *Yerušalayim*, 4, 1952, pp. 13-20 (Hebrew).

[22] See Mazar, *op. cit.* (supra, n. 21) p. 14; its identification with Qurn Ḥaṭṭîn should be considered, as this is doubtless the place of an important Canaanite-Israelite fortress-city (see G. Dalman, *PJb*, 10, 1914, pp. 41-42; A. Alt, *PJb*, 23, 1927, p. 43; W.F. Albright, *BASOR*, 29, 1928, pp. 5-6; 35, 1929, pp.9-10;

Orontes and going on up to northern Syria.[23] After finishing his military operations in Syria, Amenhotep II began to return to Egypt. On his way back he passed Qadeš on the Orontes, which surrendered without resistance. Marching from there southwards, he reached R3bỉw (i.e. לבא חמת) in the forest, in which region he indulged in the pleasures of hunting. After that, we are told: 'His Majesty proceeded by chariot to Ḫašabu, alone, without having a companion. He returned thence in a short moment, and he brought back 16 living maryanu on the two sides of his chariot, 20 hands at the foreheads of his horses, and 60 cattle being driven before him. Submission was made to His Majesty by this town'.

The geographical position of the city is clear and suits the position of 'Amqi in the EA letters and the Hittite texts. Amenhotep reaches Hašabu after לבא on his return southwards, which agrees with our previous conclusion that 'Amqi must be south of Lab/pana, but not very far from it.[24] From the Amenhotep text it appears that Ḫašabu was not on the main road, for on his way northwards from šmš ỉtm to the Orontes he did not touch that city. Only on his way back had he time for pleasure and diversion, stopping at לבא to hunt and thereafter making a raid on Ḫašabu.

There is only one region which fits all these conditions, and that is the Liṭâni Valley north of Jibb Jenîn. The direct road from the Jordan Valley to the vicinity of Baalbek and the Orontes does not pass here. It continues northward by the way of the Ḫaṣbani Valley and the Wadi et-Teim, while a long and narrow mountain ridge, Jebel Bîr edh-Dhahr and Jebel el-Gharbi,[25] rises between

J. Garstang: *Joshua-Judges*. London, 1931, p. 101). In an examination of the tell with Mrs. Miriam Tadmor-Yehieli, Mrs. Tirza and Mr. B. Rabani we found on its summit and slopes many sherds of the MB, LB, Iron I and Iron II periods, besides a few EB, Persian and Hellenistic sherds. The usual identification of that tell with Madon (Jos. xi,1; xii,19) does not seem suitable, because it is based only on the similarity of the name with the nearby Kh. Madîn, while the correct text of the O.T. in this passage is certainly מרון-מרום, as in the Septuagint. In the list of Thutmosis III šmš ỉtm occurs beside ỉnḫrt (אנחרת=Tell el-'Ajjûl, see Mazar, *Encyclopaedia Biblica*, I, p. 451). It should be remembered that the main road from Megiddo via Anaḥarat to Kinneret passes through Qurn Ḥaṭṭîn. This high mound, which dominates the roads in Eastern Galilee and is a landmark of the region, was probably the site of a sanctuary from ancient times, such as we may suppose to exist in a place called בית שמש.

[23] See Mazar, *op. cit.* (supra, n. 21), pp. 15-16; A. H. Gardiner: *Ancient Egyptian Onomastica*, I. Oxford, 1947, pp. 153*-168*.

[24] I therefore cannot agree with the latest proposal of Mazar, *op. cit.* (supra, n.21), p. 16, to identify 'Amqi with the Ḫuleh Valley. In this region there is also no room for the many royal cities, known from the EA letters.

[25] E. Robinson: *Later Biblical Researches in Palestine and in the Adjacent Regions. A Journal of Travels in the Year 1852*. Boston, 1856, pp. 428-430.

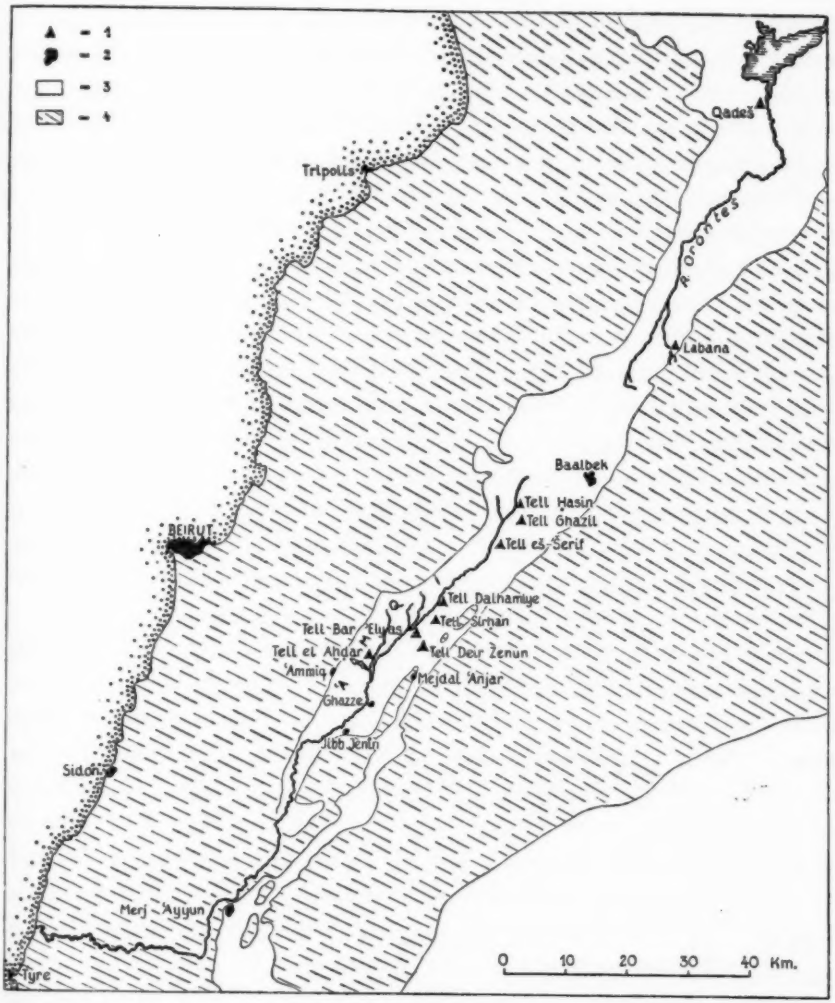


Fig. 1. The Land of 'Amqi. 1—ancient sites; 2—modern towns; 3—Liṭâni and Orontes valleys; 4—mountains. *(Drawn by M. Seydewitz)*

it and the Liṭâni Valley. The Liṭâni River, which flows in the south through a steep and narrow cleft, passes here through a broad and fertile plain over ten km. wide and well watered by the many tributaries of the river. This plain is still fertile and well populated. It contains many ancient mounds and there is plenty of room in it and its vicinity for the nine or ten cities mentioned in the

EA letters. This עמק (valley) is situated south of Labwe, but not too far away; it suits well the Egyptian border country of the time of Šuppiluliuma. Its greater part is not on the main road passing the Lebanon valley.

The precise identification of the different cities presents many difficulties. In the Lebanon region in general, only very few ancient names have been preserved, possibly because of the absence of continuous settlement. We also lack any systematic archaeological survey of the region, which could help us in the identification of the ancient sites. To the best of our knowledge, only Jirku examined a few of the tells of this region in 1932;[26] his findings fit our conclusions very well. He indicates the absence of ancient mounds in the stretch of about 30 km. between Labwe and Tell Ḫasin, located at the sources of the Liṭâni south-west of Baalbek. This area is the hilly region of the watershed between the Liṭâni and the Orontes rivers, which until our own day was partly swampy and consequently less populated and less fertile than the rich valleys bordering it to the south and the north. We may therefore suppose that the region of Baalbek was wooded and thinly populated, which fits the statement of Amenhotep about the hunting grounds and forests near לבא. On the other hand, Jirku indicates that in the Liṭâni Valley itself, at a distance of about 10 km. from Baalbek, there begins a chain of significant mounds. He examined here seven tells; on the surface of all of them, he states, pottery of the Late Bronze Age was found, while that of the Iron Age was absent in most of them.[27] The names of these tells from north to south are: Tell Ḫasin,[28] Tell Ghâzil, Tell eš-Šerîf, Tell Dalhamîye, Tell Sirḫân, Tell Bar-'Elyâs and Tell Deir Zeinûn. The modern maps add a few more names of tells such as Tell el-Hawa, Tell el-'Ayyûb, Tell el-'Aḫḍar, Tell ed-Deir etc. The pottery findings, according to Jirku, support the identification of the area with the land of 'Amqi and its cities, as they appear in the texts of the Late Bronze Age only. We may suppose that most of them were desolated in the troubles from which that region suffered at the end of the Bronze Age, partly from the Ḫapiru (according to the evidence of the king of Ḫazi), and partly from the Hittites, who were allied with the king of Qadeš.

[26] A. Jirku: Neue Forschungen in Syrien und Palästina, *Zeitschr. Deutsch. Morgenländ. Ges.*, N.F., 11, 1933, pp. 170-192. [27] Jirku, *op. cit.* (supra, n.26), p. 181 ff., found also sherds of the Hellenistic, Roman and Byzantine periods, which he calls $E_3$.

[28] Jirku mentions a fountain nearby with the name 'Ein Ḫešbe. One would like to suppose that here the ancient name of Ḫašabu has been preserved, but this Arabic name, which means wood, timber, is too common for topographical consequences to be drawn from it.

Jirku supposes, on the basis of his archaeological examinations only, that the absence of tells north and south of Labwe indicates the existence of at least three independent realms between Lebanon and Antilebanon. The southernmost of them is the land of 'Amqi, which was situated in the Liṭâni Valley from Tell Ḫasin to Jibb Jenîn, with its centre approximately at Bar 'Elyâs.

Some of the ancient names are still preserved in that region. First of all the name עמק — 'amqi itself has been preserved in the name of a large village on the western side of the valley: 'Ammîq.[29] One of the large villages in the southern part of the valley, Ghazze on the Liṭâni, corresponds to the name of ancient Ḫazi. For Magdali we may look in the vicinity of Majdal 'Anjar, as already suggested by Abel.[30] But the absence of ancient names connected with the tells and the paucity of our historical sources do not make it possible as yet to distribute the cities of 'Amqi, as known from the EA letters, among the various ancient tells in that region.

In any case there can be no doubt that all the nine cities mentioned above, including Ḫašabu, Tušulti and Ḫazi, are to be located in this area, and the various attempts to locate these cities in other regions[31] are without foundation.

[29] This has been noticed already by Abel, *op. cit.* (supra, n.1), II, p.7, who does not, however, draw any topographical conclusions therefrom.

[30] Abel, *op. cit.* (supra, n.1), II, p.7.

[31] See e.g. the proposed identifications of Abel, *op. cit.* (supra, n.1), II, pp.7-8.

# An Inventory of the Land of Israel

## Land Classification for Use with Soil Conservation

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THE unprecedented immigration into Israel has imposed a special urgency to make the most of all the land- and water-resources of the country. As Reifenberg,[1] the senior author,[2] and others have concluded, much of the land has been badly damaged by misuse, neglect and soil erosion in past centuries. Soils have been washed off the hills, a part carried by flood waters out to the sea and a part deposited on wadi floors and on flood plains. Much of the rich alluvial deposits is deep, much deeper than is required for agriculture. In this way soils have been moved from the uplands and deposited in the lowlands on good alluvium. The total area of crop land has thus been reduced through the centuries by unchecked soil erosion. The people of Israel are confronted with and are at work on the reconquest of a man-made desert.

There remains, however, much good land of deep soils in rolling foothills, in flood plains of wadis, in the coastal plain and in the extensive loessal lands of the northern Negev.

There are other potentialities hitherto untouched for lack of enterprise and application of modern engineering technologies. These are such as are envisaged in the proposed scheme of the Jordan Valley Authority (JVA). Parts I and II include the drainage of the Huleh, deep-well drilling now under way, diversions of the upper Jordan River and its tributaries for irrigation of the northern Negev, and the diversion of water from the Mediterranean and its drop through turbines to the Dead Sea for hydroelectric power. The third and less publicized

[1] A. Reifenberg: *The Soils of Palestine*. 2nd ed. London, 1947.

[2] W. C. Lowdermilk: *Palestine: Land of Promise*. New York, 1944.

phase of the JVA includes the application of principles of soil and water conservation to all kinds of land in Israel.

Mineral resources and their development are beyond the scope of this paper.

One limitation of the full use of good land for its highest purpose of growing food should be mentioned at this point. Some of the best land has already been retired from the production of agricultural crops by the encroachment of cities and towns and the location of industries. In many cases, lands of less productive capacity might well have been used instead. A still larger area is threatened in the plans for extending certain urban areas and locations of new industries. Such use of the best lands, especially of flood plains and alluvial bottoms lying favourably for irrigation must be deplored by reason of the shortage of good agricultural land in Israel. This is a misuse of good land, unless it is utterly impossible to find other sites on less productive land for these installations. The lands of Israel are limited. Of all nations Israel can least afford to waste its good soil or to retire it from production of food. Good land needs to be used to capacity and at the same time safeguarded from wastage, misuse or any other use below its full capacity.

A program of full use with soil conservation calls for an inventory of the many kinds of land in the country to serve as a basis of classifying lands for safe, sustained and improved uses. Such a classification is needful for allocation, planning and programming land-development for cultivated crops, orchards, pastures and forests with necessary precautions and measures for conservation. Such an inventory also serves to delimit tracts that require more detailed survey for lay-outs for soil conservation and irrigation. The inventory will become the basis for determining requirements in amounts and times of delivery of water for areas suitable for irrigation, and for revising existing allocations in the interests of greater sustained production of crops.

This inventory was begun in 1950. Prior to the making of field surveys, all available information relating to soils and their uses was assembled, such as existing soil surveys, soil studies with analyses, and determination of infiltration rates of rain waters and of irrigation waters. Other more general information was also included, such as meteorological records of temperature, precipitation, evaporation, winds (with directions and maximum velocities of high winds) and hydrological data on run-off in rates and amounts.

There are lacking, however, adequate basic data or information for designs of soil conservation measures, such as intensities of rainfall for 10, 20, 30 and

60 minute intervals, frequencies of heavy storms, and amounts of storm run-off to be expected, from small areas of 100 to 1000 dunams[3] of agricultural land. A beginning to supply these deficiencies in basic data has been made, and an active program of research and investigation is planned to find the facts that are needed for designs of works and prescription of adequate measures.

Field surveys in this inventory have been carried out for all the country of Israel from Beersheba northwards covering an area of about ten million dunams. At present summations by separate problem areas are in progress. The summation of Problem Area No. 1 including the Huleh Basin has been completed and is given in this paper as representative of findings.

In making these field surveys it was necessary to select those characteristics of land that should be known in classifying the land and in designing and planning works and measures for the protection of land under use, field by field and tract by tract. These essential characteristics became the legend used in field mapping, with each expressed in a range of 5 to 10 grades.

The survey unit is a land-type with boundaries that are distinguishable by determinations of essential characteristics of land as set up in the mapping legend. Boundaries of land-type units are marked on the field base map by the soil conservation surveyor. An area of 10 to 40 dunams was set as a minimum of land-type unit that was recognized in mapping in the field, according to the possible use of the area.

Next in importance were adequate base maps to be used by soil conservation surveyors for recording their determinations in the field. The aerial photograph as produced in photogrammetric surveys, when enlarged to a scale of 1:20,000, served this purpose very well. On this scale 50 mm. on the map equal 1 km. on the ground. Landmarks on the enlargement of the original aerial photograph permitted the surveyor to locate himself within 2 to 3 metres of his exact position on the base map. This advantage of aerial photographs speeds the work of the soil conservation surveyor much faster than the use of any other type of base map.

Soil conservation surveyors were provided with soil-augurs and spades, clinometers, soil sampling equipment, tapes, enlargements of aerial photographs, mapping boards, a compass, and a large scale map on which the track for the survey was delimited. Plans were made for the most effective course in traversing

[3] 1 dunam equals 0.247 acres.

the area on foot. Before setting out on the field survey, the surveyors were made acquainted with the geology, the topograpy, climatic factors, hydrology, roads, and land-use history of the area to be surveyed.

They were also prepared to collect soil samples for mechanical and chemical analyses, and for pH determinations and infiltration tests. Thus determinations made in the field survey are made against a background of information about general characteristics of the locality, and with checks on the judgment and experience of the surveyors by laboratory tests.

In this type of soil conservation survey, however, no attempt is made to discover and to measure all the characteristics of the land. As the farmer has never waited to learn all about the soil before he plowed his field, so the soil conservation surveyor cannot wait to learn all about so complex a natural body as the soil and its place in a landscape. To do so will take many years of study involving analyses of many sorts and many field trials in cropping and soil management.

It happens, however, that full use with conservation of the land from year to year is most affected by the rate of erosion by water or by wind that a soil may suffer when cultivated, or when grazed by livestock. It happens that the basic measures in safeguarding soils under cultivation are the contour lay-out, contour cultivation and terracing for the control and conservation of storm water as based on proper land classification. When the soil is protected with these basic measures other improvements in soil management and production come naturally; for when the physical integrity of the soil resource is safeguarded, there is liberty of action and freedom of choice in planting this or that crop, or in applying more or less fertilizer as market demands justify. The benefits of contour lay-out and cultivation are cumulative, whereas the damage by soil erosion to unprotected fields is also cumulative in the opposite direction, year by year lessening productive capacity and freedom of choice in the use of land until it is abandoned, or until reclamation of the land must be carried out at high cost.

The soil conservation surveyors then systematically traversed the tract to be mapped so as to inspect every part of it, and made the following determinations in the field and recorded them on field base maps being enlargements of aerial photographs. These land facts are:

Effective depth of soil—in 5 degrees;

Stoniness—in 5 degrees;

Texture—of top soil and of subsoil—in 7 degrees;

Colour—as an indicator of certain characteristics—in 10 colours;

Slope—average of each land-unit—in 6 degrees;

Erosion—degree and kind—in 9 degrees.

These characteristics of each land-type unit are expressed as a fraction, in kind and degree, as:

$$\frac{D_x \; S_x \; T_x \; C_x}{Sl_x \; E_x} \times Y$$

where D = Depth, T = Texture of Soil, Sl = Slope Class, S = Stoniness, C = Colour, E = Erosion, x = degree of each character

Other features of a land unit that require special consideration are expressed as a multiplier of this fraction as Y. Moreover, overall characteristics of the area of which a land unit is a part are included in a technical description of the area and of the land-types therein.

Then the separate field maps on enlargements of aerial photographs were assembled in the photogrammetric laboratory. The photographs were brought to the scale of the base-map, 1:20,000, by a special projector. Boundaries of land-units were transferred to this map and were joined from one field map to the other. Where necessary field checks were made.

The next step was to classify land-units for land-use capability; this is one of the most important results of the inventory. These land-capability classes are evaluations for practical use in designing, prescribing and applying measures and works of soil and water conservation for different land-types under different uses. This, in other words, is an interpretation of the facts about the land as determined and recorded by the soil conservation surveyors.

Basic distinctions for the classification of land were worked out by specialists in the several fields concerned such as soil science, agricultural engineering, agronomy, horticulture, range management and forestry. The objective was to integrate the full use of different types of land with conservation of soil and of rains that fall on it.

The first distinction is made between lands suited for cultivation and those unsuited for this purpose. The first grouping is further divided into four classes—I, II, III and IV—varying basically with the hazards to the soil under cultivation. The latter grouping is further divided into three classes, all of which must be kept under a complete cover of vegetation, class V for natural grasses as

pasture land, VI for trees as forest land and VII as rough rocky country suited only for park areas.

Sub-classes were also recognized to indicate special conditions that call for modifications in use or measures to protect and improve the productivity of the soil.

Briefly summarized, Land-use Capability Classes used in this inventory were based primarily on hazards to soils and corresponding basic measures to safeguard soil under cultivation and other uses. This classification was first made for dry-land farming and then modified as necessary when land may be irrigated. The classes are:

Class I Good land, nearly flat, cultivation possible without special soil conservation practices; only needs good soil management.

II Moderately good land on gentle slopes, cultivation possible with simple soil conservation measures due to moderate limitations and hazards to cultivation.

II F Moderately good land, subject to hazards of floods, requiring flood control measures.

II W Moderately good land, subject to hazards of seasonal high water table, requiring measures for drainage.

II a Moderately good land, subject to the hazard of becoming salty with irrigation, requiring special measures of drainage.

III Fairly good land, more sloping, with high hazards of erosion and with exacting limitations to cultivation, requiring complex soil conservation practices and measures to safeguard soils under cultivation.

III a Fairly good land, with high rates of salinity, requiring reclamation for cropping.

III W Fairly good land, naturally marshy or becoming so with irrigation, requiring major works of reclamation.

IV Fair land on steeper slopes with extreme hazards of soil erosion when cultivated; suitable only for limited cultivation such as irrigated pastures and terraced plantations.

IV D Sand-dunes in movement, limited in use after fixation.

V Rough land not suited for any cultivation; use is limited to grazing for livestock with moderate restrictions in natural grass-land management.

VI Very rough land, not suited for any cultivation but generally suited for grazing with complex restrictions in management, or for forest plantations and forests with adequate management.

VII Very rough land with little or no economic use, suited only for reservation for natural parks, for wild life and scenic recreational purposes.

After land-units were classified on this basis, a further step was taken to define and to mark off Land-use Problem Areas. Such an area includes similar problems in the full use with conservation of soil and water, so that solutions worked out on typical land-units will generally be applicable to other land-units of the same class.

This division of the lands of Israel facilitates the planning and application of measures of soil and water conservation in the course of farming operations. It is very useful in integrating conservation measures with farming operations, and in carrying out a land-use policy and program for the country.

The lands of Israel north of Beersheba suitable for cultivation and natural grazing have been divided for convenience into 20 Land-use Problem Areas, as indicated on the map (Fig. 1).

Problem Area No. 1 including the Huleh Basin is shown on Plate 7.

## THE HULEH BASIN PROBLEM AREA

The history of the settlement of the northern Huleh Basin since 1838 has been outlined by Y. Karmon.[4] The reader is referred to this excellent study of former land-use of this area. The land inventory of the Huleh Basin has disclosed information basic to an appraisal of the productive capacity of the several types of land, as well as to measures in soil and water conservation necessary to make the most of the resources of this picturesque section of Israel.

Malaria has been a major factor retarding the use and development of the lands of the Huleh Basin. In Roman times, when Caesarea Philippi flourished, the area was more densely populated and more prosperous than in the following centuries. Since that time the area has declined in importance, chiefly owing to the ravages of malaria and depopulation. Since the coming of Jewish settlements in the nineteen-thirties a program of eliminating malaria and of protecting the inhabitants from its ravages has been carried out successfully.

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[4] Y. Karmon: The Settlement of the Northern Huleh Valley since 1838, *IEJ*, 3, 1953, pp. 4-25.

Al Mutrabiya
Az Zawiya
Khalisa
Tall Abu Naima
Al Massa
Tall Barbara
Tall Abu Hamad
Tall Abu Ghoar
Tall Abu Ghoar
Tall Abu Ghoar

Hula Concession Area

Hula Concession Area
Landing Ground
Nabi Yusha
ARAB AL
Beisamun
Mallaha
Harrawassis
Al 'Ulmaniya
LAKE HULA
70
Tell Abqufiya
Kh. al Ma'sara
Yesud hama'ala
Dibbuts Hulata
Tell Hazeqa
Tell Juleil
Hayo al Mukabra
Qaqun
Ramat Yohanan
Ramat Dalia
Ramat Hakovesh
Ramat Hakovesh
Ramat Hakovesh

Moreover, a scheme now under way by the Jewish National Fund (Keren Kayemet Leïsrael) for the drainage of Lake Huleh, the papyrus swamps, and the fringing marshland will reclaim some 65,000 dunams of land for agricultural purposes. It is expected that on the reclaimed area 2,000 new agricultural units may be established.

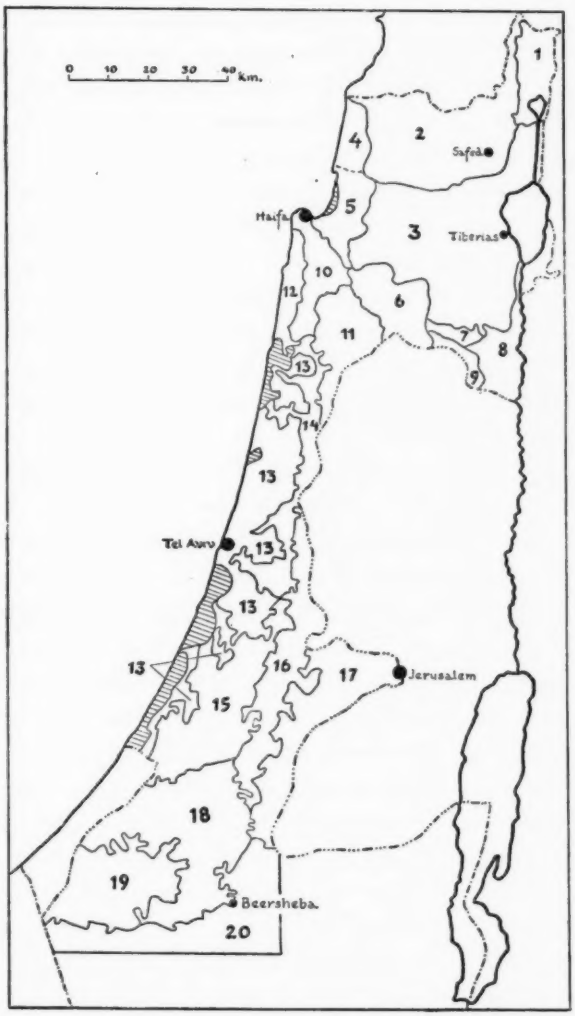


Fig. 1. Land-use Problem Areas of Israel.
Dunes shaded. *(Drawn by N. Z. Baer)*

The land outlined on Plate 7 has been designated as Problem Area No. 1 of the Land Inventory of Israel. Its boundaries enclose an area where problems in land-use, reclamation and conservation are related and include enough factors in common in the use, protection and improvement of lands to justify working out a special integrated program of land-use with conservation. For these purposes the lands of the floor of the Huleh Basin and foothills of the eastern border to the boundary between Israel and Syria have been included. The steep fault scarp on the west has problems that relate it to the highlands of Galilee, and are not included in this problem area.

Within the boundaries of the problem area of 207,480 dunams are four major land forms which call for special treatment in a land conservation program. They are:

1. Dan—Hermon Piedmont slopes, between elevations of 200 and 100 metres.
2. Eastern basaltic foothills, 100 to 275 metres in altitude.
3. The floor of the Huleh Basin, from 100 to 70 metres in altitude.
4. The Papyrus Marsh and Lake Huleh, whose surface varies between 70-72 metres altitude.

The climate is mediterranean and locally has certain distinctive features by reason of topography. Average temperatures of summer fall between 25 and 28 degrees centigrade, those of winter between 12 and 14. Frost and freezing temperatures may occur in January and February in the basin floor, into which drains the cold air from the surrounding mountains.

Typical of the country, winters are rainy seasons and summers are long and dry from May to October. Total rainfall varies between averages of 650 mm. in the north and 450 mm. at the southern end of the problem area. Dew is relatively scanty. Humidity lies between 60 and 70 per cent, and evaporation from free water surfaces is estimated to amount to approximately 170 cm. per annum.

The climate is favourable to two crops of grains and vegetables a year; it especially favours deciduous fruits, such as apples and pears. Alfalfa gives high yields. Winter crops that suffer from freezing and near freezing temperatures are not suited to the Huleh Basin Problem Area.

Winds are strong at times. Air drains off Mount Hermon and the Hauran Plateau and off the highlands of Galilee, sometimes becoming strong turbulent winds which dry up as they descend. Desiccating *sharav*-winds may blow out of the east and north-east from one to three days at a time. Evaporation- and transpiration-demands on crops and orchards are high at these times.

The three main tributaries of the River Jordan are the Banias, the Litani and the Hasbani which cross the boundary of Israel. These streams flow down the Piedmont in clear rushing streams entrenched in slight to considerable depths in the Piedmont slope. Many springs issue forth at the base of the fault scarps along the margin of the basin floor. Ground-water in the north stands near the land surface and further to the south approaches the surface finally to form marshy land. During winter, ground-water rises and extends marshy conditions. Drainage and control of water levels are required for the full use of these areas, and are planned in the Huleh Reclamation Project, now under way.

Of the estimated 600 million cu.m. of water originating in and flowing through the Huleh Basin it is planned, in time, to make use of some 130 million, including about 46 million for fish ponds. There will therefore be about 470 million cu.m. available for diversions and for replenishing Lake Tiberias.

No studies have yet been made on the duty of water for the several crops now grown. It is common practice at the village of Dafne, for example, to apply about 1200 cu.m. per dunam-year (d/y) for alfalfa and 600 cu.m. for a crop of vegetables, with 700 cu.m. per year for apples. Two crops of vegetables are grown in one year that together call for 1200 cu.m. How much of this water percolates below root zones is not known. This lack of essential information calls for experimental studies on the duty of water and its efficient use for this problem area. A sub-station of the Agricultural Experiment Station is desirable for this purpose.

The form of the Huleh Basin, the character of its rocks and soil materials and their accumulation and formation into soils is founded on the geology of this problem area. The basin at the head of the rift or down faulted valley of the Jordan trench is part of this same faulting. It may be presumed that the eastern wall of the basin was also a steep fault scarp as is the western wall. But after the valley had been faulted down volcanic activity on the Hauran Plateau gave rise to lava flows that poured over the fault scarp down into the trench, since not long before the Ice Age. A much larger flow filled up the valley along latitude 33 north, building up a barrier to 300 metres above sea level. This barrier caused the formation of a lake, once much larger, that has survived in the present Lake Huleh.

Since the formation of this barrier, peat has accumulated in two separate bodies;[5] the older and deeper is 60 metres thick, with an estimated amount of 300-500 million tons dry weight, and is covered by a 30 metres layer of light coloured marl. Above this is a later accumulation of peat about 5 metres thick of an estimated 30-50 million tons dry weight that has come from the present papyrus growth in the existing papyrus swamp.

These facts are further evidence of the formation in Ice Age times of Lake Jordan that filled the Jordan Rift Valley to a point above sea level and in which the beds of Lisan marls were laid down. After Lake Jordan receded, owing to excess of evaporation over inflow, the marsh returned. Organic material of

[5] L. Picard: The Pleistocene Peat of Lake Hula, *BRCI*, 2, 1952, pp. 147-156.

papyrus growth accumulated in the waters of the marsh and eventually formed this upper layer of peat.

The exploitation of the peat resources is planned as a phase of the Huleh Reclamation Project now being carried out by the Jewish National Fund.

Of the climax vegetation the papyrus of the extensive swamps has been least modified by human activities. This is the most northerly occurrence of this plant. Beside the River Dan near an old Moslem graveyard a stand of native oaks *(Quercus Coccifera)* called the 'Grove of the Forty' has been preserved on shallow soil. But there are more nearly 100 old trees in a park-like stand with grasses and herbs between. No doubt such a plant formation covered much of the well-drained lands of the basin floor. The slopes now covered with grasses and low woody shrubs were covered with maquis plant associations.

## SURVEY INFORMATION

*Soils.*—Soil characteristics are related to the three land forms, designated as the (a) Dan-Hermon Piedmont, (b) Eastern Basaltic Foothills and (c) The Basin Floor. Parent materials are derived from soft limestone, weathered hard limestone and basalt.

Soils of the Dan Piedmont are derived from colluvial materials; top soils include loam, sandy clay loams, and clay. Colours vary from light reddish brown to brown. Soil profile development is immature, permeable and free from alkali. Determinations show organic matter to be about 2.5 per cent; the pH varies between 7.5-8.0. Lime content is high in places, averaging over 50 per cent in soils of the Dafne area, but elsewhere from 30 to 0 per cent.

Soils of the basaltic foothills along the eastern border are heavy clays derived from the weathering of basalt and occur as skeletal profiles. These soils are free of lime, but in other soils of the foothills lime content varies between 10 and 20 per cent. Organic matter is about 2 per cent, and pH 7.0-9.0. Permeability is very low. Generally these soils are very stony with uneven surfaces, and are unsuited to cultivation unless costly works of removing stones is carried out.

Soils of the basin floor are free of salts except for traces of soluble salts found on the eastern and western borders. Colluvial material along the margins of the basin floor are generally saline, the organic matter varies between 2.5 and 4 per cent, and pH values between 7.5 and 7.8. Lime content varies between 20-40 per cent.

*Soil Erosion.*—Owing to the prevailing low gradients of lands of the basin

floor that were first selected for cultivation, the area shows minor damage from soil erosion. In the formulae representing soil characteristics as determined by soil conservation surveyors set down within each land-unit as mapped, it will be seen that 'O' erosion is generally associated with A slopes (0-2 per cent) and correspondingly more severe erosion has taken place on D slopes (15-25 per cent). Erosion 3 and 5 occur on steeper slopes of isolated ridges and on valley slopes.

Overwash of materials eroded from steep slopes and especially from wadis draining part of the Hauran Plateau damage margins of alluvial lands of the basin floor. Such material is brought down by torrential floods carrying boulders and finer material out in out-wash fans. At times of heavy rains, floods spread out on the adjacent valley floor.

Soils show lack of uniformity by reason of alluvial and colluvial accumulations and of past soil erosion under cultivation. Profiles are quite variable. Suitability for cultivated crops must be established by field inspections.

## LAND CLASSIFICATION OF HULEH BASIN PROBLEM AREA

The land inventory yields the status of the entire area as follows:

| | | |
|---|---|---|
| Area surveyed and classified | | 129,120 dunams |
| including: | | |
| Roads Class 1 | 4,400 dunams | |
| Roads Class 2 | 2,900 " | |
| Flooded land | 15,800 " | |
| Swampy areas | 1,590 " | |
| Unsurveyed areas: | | |
| Built-up areas | | 4,550 dunams |
| Ruins of villages | | 490 " |
| Tells (historic sites) | | 700 " |
| Fish ponds | | 11,940 " |
| Rivers | | 4,070 " |
| Flooded land | | 110 " |
| Swamps, detached | | 980 " |
| Huleh Papyrus Swamp | | 32,350 " |
| Lake Huleh | | 15,040 " |
| Unsurveyed | | 8,130 " |
| Total area | | 207,480 dunams |

The surveyed area was classified under two possibilities of use, first as dry land depending only on winter rainfall, and second, a more detailed survey of that part suited to cultivation that may be irrigated and may be reclaimed from swamps and marshy conditions. The classification of the Huleh area follows:

Class I Good land, suitable for cultivation without special practices, only needs good soil management—area 49,510 dunams.

II Moderately good land, suitable for cultivation with simple easily applied conservation practices. Hazards to soil under use are moderate—area 31,590 dunams.

IIF Same type of land subject to flooding—area 15,910 dunams.

III Fairly good land, suitable for cultivation only with special measures. Hazards to soil under cultivation and cropping are high—area 8,340 dunams.

IV Fair land of depth 3-5 unsuited to continuous cultivation, but suited to orchards and vineyards, when laid out on the contour. Hazards to soil under use are great, requiring special measures to control erosion and storm run-off from heavy rains. The area in this class in the Huleh Basin is too small to be mapped out separately.

V Land entirely unsuited to cultivation, by reason of steepness of slope, stoniness or shallowness of soil and similar limitations. Such land is suited to grazing use, or to planting up to forests, if rainfall is sufficient to support growth of trees in a forest formation—area 14,420 dunams.

VW Land unsuited to cultivation by reason of marshy conditions and a high water table. Such land is usually available for reclamation by drainage. This area is included under the heading of potential reclamation by irrigation or by drainage—area 2,570 dunams.

V(II)-(III) Land unsuited to cultivation by reason of heavy layer of stones; but subject to reclamation by stone removal if returns justify costs of such operations—area V(II) 1,250, V(III) 4,960 dunams. Total 6,210 dunams.

VI Land unsuited to cultivation or to pasture, but may be assigned to parks and wild life areas, or to forest plantations—area 1,680 dunams.

Of this problem area, the land found to be suited to cultivation with appropriate safeguards against erosion and damage makes up 105,350 dunams,

excluding areas to be reclaimed. Land suitable for irrigation when works of reclamation are completed is indicated by land classes as follows:

| | | |
|---|---|---|
| I | 100,900 dunams, | including 34,920 dunams in marshes, which can be cultivated when drained |
| II-III | 34,530 " | |
| IV | 11,050 " | suitable for irrigated pasture, when cleared of stones |
| | 146,480 dunams | |

If the duty of water proves to average 1000 cu.m. per dunam for two crops, and 700 for orchards and irrigated pasture, the annual requirement would be about 140 million cu.m. This figure is 10 million higher than called for in the Master Water Plan. At present over-irrigation is the prevailing practice; with proper duty of water it should be less. How much less, can only be determined by proper studies.

Of the 15,040 dunams in Lake Huleh about 10,000 dunams will become dry land after drainage.

Small areas of class V land within cultivated areas, where impractical for pasture by reason of small size or of location, may properly be planted up to wood-lots. The species to be used would be prescribed by the Forestry Department.

## LOCAL PROBLEMS AND HAZARDS IN USES OF LAND

1. Dry summer seasons require irrigation.
2. High water tables in winter rainy seasons require adequate drainage works.
3. Frost occurs in January and February and calls for selection of suitable crops and timing of sowing.
4. Stone removal on class III and IV land.
5. Wind erosion of soils rich in lime.
6. Drainage on a scale required to drain surrounding fields.
7. High lime content of some soils.
8. High alkali content in spots of soils derived from basaltic lava flows and the occurrence of selenium.
9. Floods of low lying land that need to be brought under control.
10. Weeds and weed control.
11. Mice—field mice have become very destructive. Special measures are needed.
12. Malaria control.
13. Economic limitations, including transport, emphasize the need for local processing of perishable products.

14. Large-scale drainage—the Huleh Scheme, now under way, will make available when completed an estimated area of 60,000 dunams. Some 2,000 new farming units will be established.[6]
15. Reclamation and use of peat deposits is possible. Studies are under way to determine whether it would be more profitable to use the peat for fertilizer or for fuel.

### CONSERVATION NEEDS OF PROBLEM AREA NO. 1

The first consideration in soil conservation planning is to safeguard the soil resource from depletion and wastage under suitable use. There are usually in each problem area and its subdivisions special requirements in safeguarding the land resource under full and intensive production, that must be provided for in lay-out and in measures and works of soil and water conservation. These the conservation planner should take into account for the area and sub-areas as a whole and for each field. For the Huleh Problem Area the most important of these needs are set forth for each sub-area as follows:

1. Dan Piedmont—Dafne Area
   Contour lay-out of fields and terracing on lands with slopes up to 15 per cent.
   (a) Soil erosion control—integrated with storm water disposal.
   (b) Weed control.
   (c) Water supply for irrigation.
   (d) Application of irrigation water.
2. Basaltic Foot-Hills
   (a) Soil erosion control.
   (b) Water supply for irrigated pastures.
   (c) Stone removal for irrigated pastures.
3. Basin Floor
   (a) Selenium control.
   (b) Drainage.
   (c) Irrigation.
   (d) Fertility maintenance.

For the entire area:

(a) Highway design to include drainage ditches along the road and their covering with grass. The ditches must be designed in a way to permit their maintenance by mowing.
(b) Weed control.

[6] E. Orni: *Huleh: Background and Development.* Jerusalem, 1952.

(c) Fishponds should be located on less productive land.

The Conservation Plan for this problem area involves the design and specification of measures and practices in use field by field and tract by tract, with the lay-out and stake-out on the ground of the works and measures required. This is the technical service rendered by the Soil Conservation Service. In general practice, the settlement or farmer whose land has thus been planned with the Soil Conservation field planner carries out the indicated works and measures. When, however, works affect an entire community, or where it is desirable to demonstrate the manner of carrying out works and the degree of excellence required, the Soil Conservation Service will carry out such works to be paid for by the settlement or the farmer.

## SUMMARY

The headwaters of the River Jordan issue from the flanks of massive Mount Hermon. They flow from three sides into the Huleh Basin, a physiographic unit-area of great natural beauty at the head of the Jordan Rift Valley.

This is an area of abundant waters, most of which issue forth from great springs. There is much water to spare and it is available for diversion to drier lands in the south—waters that now are being lost in evaporation from the Dead Sea.

At present the Huleh Basin with its abundant water and limited area of good land is not producing crops to full capacity. So far it is only partially developed to the potentialities of its several types of resources. Full development will include such works as the draining of Lake Huleh, the papyrus swamps and fringing marshes, the construction of a water supply system to make the most of irrigation water, the integration of the power system, the establishment of processing plants for perishable agricultural products, the good use of peat deposits, the development of recreation facilities, including parks and resorts, and the preservation of sample areas of natural wild life, sanctuaries of animals and plants.

The plan of development will be integrated for full use of the several types of resources to achieve the greatest total production of useful products, a stable prosperous community and cultural benefits in recreation and inspiration of this potential Garden of Eden in miniature. To realize such benefits calls for an orderly program of works, that are now planned and are under way, to be completed within the next decade.

# La Palestine. Etude morphométrique*

E. DE VAUMAS

Paris

### 2° *Altitudes moyennes et coefficients de massivité*

DANS la montagne, les altitudes moyennes (608 m. pour la montagne N.; 733 m. pour la partie S.; 662 m. pour l'ensemble) dépassent largement dans tous les cas la moitié de l'altitude maximum, qui varie de 1016 à 1020 m.

Les coefficients de massivité sont donc considérables et atteignent 59 %, 71 % et 64 % et rappellent celui de la Haute Galilée libanaise (63 %).

L'adjonction de la basse région limitrophe abaisse évidemment les altitudes moyennes et les coefficients de massivité de manière très sensible, mais beaucoup moins cependant qu'on ne pourrait le penser au premier abord. Si le haut pays septentrional ne fait que 321 m. d'altitude moyenne et 29 % de coefficient de massivité, le haut pays central monte encore à 449 m. et 44 %, le haut pays méridional à 467 m. et 45 %, tandis que l'ensemble du massif palestinien est caractérisé par les chiffres de 436 m. et 42 %. Ces chiffres sont supérieurs à ceux du massif galiléen: 415 m. et 34 %. Le massif palestinien est donc plus compact et moins aéré que celui-ci.

Comme c'était le cas pour ce dernier, on peut estimer que les coefficients de massivité actuels sont très proches de la massivité parfaite et que l'aération est essentiellement d'origine structurale.[10]

### 3° *Le massif palestinien rapporté au niveau de la base de la Mer Morte*

Le massif palestinien mérite beaucoup plus que le massif galiléen d'être rapporté au niveau de base de la Mer Morte; le Ghor dont l'altitude est partout inférieure à celle de la Méditerranée le borde en effet d'un bout à l'autre et constitue vraiment pour lui un niveau de base.

Rapportées au zéro de la Mer Morte, les courbes hypsographiques sont toutes du type convexe-concave avec deux sommets de courbure, même celles

* Suite à l'*Israel Exploration Journal*, 3, 1953, pp. 79-93.

[10] Cf. supra, pp. 86-87.

du haut pays qui l'étaient à peine quand on les calculait en fonction de la Méditerranée.

La réapparition d'altitudes inférieures aux superficies restreintes met bien en évidence le caractère de fossé orographique qui est précisément celui du Jourdain. Elle correspond à la plongée très rapide des couches et aux failles par lesquelles se fait le raccordement du massif palestinien et de la vallée du Jourdain.

Les altitudes moyennes et les coefficients de massivité sont très forts. Le noyau montagneux fait 1051 m. MM d'altitude moyenne pour 1412 m. MM d'altitude maximum, ce qui donne un coefficient de massivité de 74 % alors qu'il n'était que de 64 % par rapport à la Mediterranée. Le haut pays septentrional fait: 696 m. MM et 52 %; le Haut pays central: 807 m. MM et 57 %; le Haut pays méridional: 845 m. MM et 59 %; l'ensemble: 799 m. et 56 %. C'est beaucoup moins que le noyau montagneux mais plus cependant que la Galilée palestinienne: 754 m. MM et 47 %.

Le massif palestinien est donc plus compact et moins aéré que celui de la Galilée dont le coefficient de massivité par rapport à la Mer Morte est seulement de 50 %.

## III. VERSANT DE LA MÉDITERRANÉE ET VERSANT DE LA MER MORTE

La ligne de partage des eaux entre la Méditerranée et le Jourdain détermine en Palestine deux versants très différents l'un de l'autre dont il est intéressant de calculer les caractéristiques morphométriques.

### *1° Le versant Méditerranéen*

Même sans tenir compte de la plaine côtière, ce versant est beaucoup plus étendu que celui qui s'abaisse vers le Jourdain. Les chiffres suivants le font ressortir suffisamment sans qu'il soit besoin d'insister:

| | Versant méditerr. | Versant jordanien |
|---|---|---|
| Galilée | 2147,5 km.$^2$ | 692 km.$^2$ |
| Galilée et dépression médiane | 2539,5 km.$^2$ | 1433 km.$^2$ |
| Haut pays palestinien | 7947 km.$^2$ | 3200 km.$^2$ |

Les courbes hypsographiques sont toutes du type concave, à l'exception de la seule courbe de la Galilée libanaise qui n'est que très faiblement convexe-concave. Les régions basses exercent donc une influence prédominante et la

montagne ne se présente plus que comme une façade dressée au dessus d'elles.

Les altitudes moyennes et les coefficients de massivité sont faibles, plus faibles que ceux de l'ensemble des massifs. Le tableau suivant souligne très nettement cette constatation:

| | Versant méditerr. | | Ensemble du massif | |
|---|---|---|---|---|
| | Alt. moy. | Coeff. de mass. | Alt. moy. | Coeff. de mass. |
| Galilée libanaise | 454 m. | 48% | 489 m. | 51% |
| Galilée palestinienne | 277 m. | 22% | 364 m. | 30% |
| Galilée | 351 m. | 28% | 415 m. | 34% |
| Ht. pays septentrional | 244 m. | 25% | 321 m. | 29% |
| Ht. pays central | 369 m. | 36% | 449 m. | 44% |
| Ht. pays méridional | 314 m. | 30% | 467 m. | 45% |
| Massif palestinien | 316 m. | 1% | 436 m. | 42% |

L'importance de ce fait est considérable sur le plan de la géographie humaine. Le versant méditerranéen est en effet celui qui est exposé aux pluies venues de la mer tandis que le versant du Jourdain est presque tout entier livré à un climat aride. La Palestine n'aurait jamais pu être peuplée si la majorité des terres, et principalement des terres basses, ne s'était trouvée du côté méditerranéen; la minorité du sol et les terres élevées étant reléguées du côté du Jourdain.

### *2° Le versant jordanien*

Les caractéristiques du versant jordanien sont inverses de celles du versant méditerranéen.

Les courbes hypsographiques frappent tout d'abord par leur longueur très réduite. Elles font ressortir ainsi la superficie relative très limitée du côté oriental par rapport au côté occidental. En outre, elles sont toutes du type convexe-concave avec double sommet de courbure et montrent bien qu'entre la ligne de partage des eaux et le fond du Ghor, s'étend à mi-pente une zone de reliefs plus tranquilles (Désert de Juda). Le caractère essentiel du versant jordanien demeure cependant son allure de façade abrupte.

## CONCLUSIONS

Un certain nombre de conclusions se dégage clairement des pages précédentes.

### *1° La grande massivité de la Palestine*

Considérés dans leur noyau montagneux ou dans leur totalité, les reliefs de Galilée et de Palestine ont des coefficients de massivité élevés.

Cela est particulièrement vrai de leur partie montagneuse dont les chiffres se situent aux alentours de 50 et même de 60 %, l'un d'eux allant jusqu'à dépasser 70 %.

| | | | |
|---|---|---|---|
| Haute Galilée | 45 % | Haute Galilée liban. | 63 % |
| | | Haute Galilée palest. | 42 % |
| Noyau palestin. | 64 % | Partie nord | 59 % |
| | | Partie sud | 71 % |

Cela reste vrai également de l'ensemble des massifs bien que l'adjonction du bas-pays aux noyaux montagneux qui les entourent, abaisse fortement ces coefficients.

| | | | |
|---|---|---|---|
| Galilée | 34 % | Galilée libanaise | 51 % |
| | | Galilée palestinienne | 30 % |
| Ht. pays palest. | 42 % | Partie septentrionale | 29 % |
| | | Partie centrale | 44 % |
| | | Partie méridionale | 45 % |

De tels chiffres sont très supérieurs à ceux que l'on obtient ordinairement dans des régions plissées (Corse: 21 %; Alpes françaises: 23 %) et se rapprochent de ceux des chaînes du type 'pli de fond' (Pyrénées françaises: 30,5 %) et même de ceux des massifs hercyniens (Auvergne: 45 %). Nous en avions déjà fait la remarque à propos du Liban et de l'Antiliban, cette constatation vaut tout autant, et même plus, pour la Galilée et la Palestine ainsi qu'on va pouvoir s'en rendre compte par quelques coefficients.

### *2° Comparaison de la Galilée et de la Palestine avec le Liban et l'Antiliban*

La Haute Galilée (45 %) est plus massive que le Liban (montagne et avant monts) dont les coefficients ne dépassent pas 42 % et 43 %. La Haute Galilée libanaise avec 63 % dépasse même l'Antiliban proprement dit (57 %) qui est pourtant la montagne la plus compacte de celles qui se trouvent au Nord de la Palestine.

Quant au noyau montagneux palestinien, il bat tous les records avec 64 %, sa partie sud atteignant même 71 %.

Le haut pays palestinien malgré l'importance des régions basses qu'il englobe, a un coefficient égal (42 %) à celui de la montagne libanaise, très nettement supérieur à celui de l'ensemble formé par le Liban et son bas pays (34 %). Il s'établit à mi-distance de celui-ci (34 %) et celui de l'Antiliban (51 %).

### *3° Conformité au relief et à la structure*

Toutes les courbes hypsographiques donnent du relief une image très parlante.

Les noyaux montagneux ont des courbes à distribution des altitudes en trois compartiments. (Altitudes inférieures réduites, altitudes moyennes bien développées, altitudes supérieures à nouveau restreintes). Ces courbes font donc bien ressortir par conséquent l'allure abrupte des pentes qui entourent la montagne sur ses bords, le caractère subhorizontal de leur partie haute, le peu d'importance de leurs sommets qui ne sont rien de plus que des buttes disséminées ici et là.

Le très large développement des régions basses qui avoisinent les noyaux montagneux (Basse Galilée, Sephela) s'inscrit très nettement aussi sur les courbes qu'il perturbe profondément. Celles-ci changent en effet de type pour devenir entièrement concaves, de convexe-concaves qu'elles étaient précédemment.

Rapportées au niveau de base de la Mer Morte, ces courbes retrouvent leur allure primitive et mettent ainsi vigoureusement en valeur le fossé orographique du Jourdain.

La structure n'est pas moins bien exprimée par ces courbes.

Dans la partie montagneuse, ces courbes correspondent tout à fait aux plis très écrasés que révèlent les coupes géologiques. Tous ces plis ont des profils en anse de panier qui remplissent presque tout le cylindre encadrant.

Dans l'ensemble du massif, les courbes hypsographiques rendent bien compte aussi de l'architecture des massifs galiléen et palestinien où les plissements qui bordent les grands plis de fond se situent nettement en contre-bas de ceux-ci.

### *4° Faiblesse du travail de l'érosion depuis le soulèvement des massifs*

Ainsi que nous avons eu l'occasion de le dire, la connaissance du relief de la Palestine n'est pas encore suffisamment poussée pour qu'on puisse faire une étude morphométrique complète. Le coefficient de massivité parfaite et les

coefficients d'aération structurale et d'aération érosive, ne peuvent être établis encore d'une manière précise. L'exemple du Liban comme les recherches personnelles que nous avons pu faire en Palestine permettent cependant d'avancer — au moins à titre d' hypothèses probables — les idées suivantes.

Le travail accompli par l'érosion se borne aux entailles des gorges suivies par les oued; nulle part, le relief n'a été largement déblayé et ne donne l'image d'une évolution quelque peu avancée. La morphologie présente bien l'aspect en de multiples endroits de surfaces d'érosion mais ici comme au Liban et dans l'Antiliban, il s'agit de témoins des cycles antérieurs au cycle actuel. Ce dernier a si peu travaillé que, mises à part les quelques vallées profondes qu'il a creusées, il n'a procédé presque nulle part à une différenciation des reliefs selon la dureté des couches. On est bien loin en Galilée et en Palestine de ces magnifiques formes structurales qui font la grandeur et la beauté de l'intérieur du Liban et qui témoignent de l'ampleur du volume montagneux déjà arrachée par l'érosion.

Ces quelques constatations permettent de soutenir que les coefficients de massivité de la Galilée et de la Palestine sont très proches de la massivité parfaite.

Presque toute l'aération de ces massifs est donc structurale et ne doit que très peu à l'érosion.

Comment expliquer ce manque de vigueur de l'activité érosive et la quasi inexistence de son travail? Plusieurs raisons peuvent en être données. La première est que le cycle actuel n'a encore que très peu duré; la dernière phase orogénique qui a procédé à la mise en place des massifs ne datant que d'hier, l'érosion n'a pas eu encore la possibilité d'accomplir son oeuvre. Cette explication pour être valable ne paraît pas cependant comme essentielle, la Palestine sous d'autres climats que celui où elle se trouve, aurait en effet été certainement beaucoup plus démantelée dans le même laps de temps.

Une deuxième raison est la nature karstique de la plupart des roches qui constituent les reliefs de la Palestine. La majorité des précipitations sont absorbées par le sol et le ruissellement est le plus souvent réduit à très peu de chose. Le karst semble bien intervenir en Palestine comme un facteur de conservation du relief.

Il y est aidé — et c'est la dernière raison qui explique le peu de progrès du travail de l'érosion — par le climat. Les pluies sont faibles en Palestine, surtout dans la vallée du Jourdain où elles sont presque inexistantes. L'agent érosif est donc très peu efficace.

## ANNEXE I

### JUSTIFICATION DES LIMITES RÉGIONALES (FIG. 1, P. 88)

La présente étude englobe la Palestine de même que la dépression du Jourdain et la Mer Morte. Elle fait suite à celle du Liban, de la Bekaa, de l'Antiliban-Hermon et de la Haute Galilée libanaise.

Le territoire dont il est question est limité:

— À L'OUEST: par la Méditerranée,

— AU NORD: par la frontière libano-palestinienne (sauf de petits espaces inclus précédemment dans l'étude de la Haute Galilée libanaise et du synclinal du Hasbani),

— À L'EST: par le contact des plateaux du Haouran et de la dépression du Houlé, ainsi que par le tracé de la fracture transjordanienne,

— AU SUD: par une ligne droite tirée de Gaza à Bersabée, par une autre droite allant de Bersabée au sommet de Ras Zuweira et prolongée jusqu'à la Mer Morte, par la Mer Morte (plaines côtières inclus), enfin par le parallèle tangent à la pointe méridionale de la Mer Morte.

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*1. Plaine côtière de Saint Jean d'Acre-Haifa.* — Méditerranée — Contact des alluvions quarternaires et des roches sédimentaires.

*2. Haute Galilée palestinienne.* — Plaine côtière (cf. 1) — Frontière libano-palestinienne et son prolongement par une ligne Ouest-Est au moment où cette frontière tourne à angle droit vers le Nord — Plaine du Houlé — Route de St. Jean d'Acre à Safed (correspondant au tracé d'une grande faille) jusqu'à Kafr Hinan; à partir de ce point, ligne ONO-ESE limitant haut pays et bas pays.

*3. Basse Galilée palestinienne.* — Plaine côtière (cf. 1) — Limite sud de la Haute Galilée (cf. 2) — Contact des plateaux volcaniques de la dépression du Houlé et de Tibériade — Plaine d'Esdrelon.

*4. Plaine d'Esdrelon.* — Contact des roches sédimentaires ou volcaniques avec les alluvions quaternaires.

*5. Plateaux volcaniques (incluant quelques petits massifs nummulitiques).* — Contact des roches volcaniques avec les roches sédimentaires ou alluviales.

*6. Plaine du Houlé.* — Retombée de la voûte galiléenne — Limite méridionale du Hasbani (cf. thèse Liban) — Contact des basaltes du Haouran — Contact des plateaux volcaniques Houlé-Tibériade.

*7. Lac du Houlé.*

*8. Plateaux volcaniques du Houlé-Tibériade.*

*9. Lac de Tibériade.*

*10. Plaines marginales du lac de Tibériade.*

*11. Plaines du Jourdain (du lac de Tibériade à la plaine de Beisan).* — Contact des roches sédimentaires ou volcaniques et des alluvions quaternaires.

*12. Plaine de Beisan.* — Idem.

*13. Apophyse de la plaine de Beisan.* — Idem.

*14. Carmel.* — Contact des alluvions quaternaires et des roches sédimentaires — Au SE, dépression sénonienne.

*15. Collines du synclinal de Megiddo.* — Contact de la plaine côtière et de la plaine d'Esdrelon — Dépressions sénoniennes séparant ce synclinal, des anticlinaux du Carmel et d'Umm el-Fahm.

*16. Anticlinal d'Umm el-Fahm.* — Contact de la plaine côtière et de la plaine d'Esdrelon — Contact Cénomamien-Sénonien.

*17. Massif palestinien — Partie septentrionale — Synclinal de Djenin.* — Contact de la plaine de Beisan et d'Esdrelon — Contact Sénonien-Cénomamien avec les anticlinaux encadrants — Route Toul Karem-Naplouse.

*18. Massif palestinien — Partie septentrionale — Anticlinal palestinien.* — Dépression sénonienne — Plaine de Beisan — Ghor — Suite de talwegs laissant Sartabé au NE.

*19. Massif palestinien — Partie centrale — Bas pays.* — Plaine côtière — Route Toul Karem-Naplouse — Limite du haut massif (cf. 20) jalonné par les villages de Huwara, Jemmaïn, Beruqin, el-Kufr, Belain, Beit Ur Tahta, puis par la pliure Beit Ur Tahta — Bab el-Ouad — Route de Jaffa à Bab el-Ouad.

*20. Massif palestinien — Partie centrale — Haut pays.* — Limite du bas pays (cf. 19) — Suite de talwegs (cf. 18) — Ghor puis désert de Juda (limité à peu près par Ras et-Tuweiyil, Béthanie, Beit Sahur près Bethléem) — Ouadi es-Sikke (chemin de fer montant à Jérusalem).

*21. Massif palestinien — Partie Méridionale. Sephela.* — Route Jaffa. Bab el-Ouad — Plaine côtière — Dépression sénonienne au contact du haut massif — Bassin de Bersabée.

*22. Massif palestinien — Partie méridionale — Haut pays.* — Dépression sénonienne au contact de la Sephela — Contact Cénomamien-Sénonien le long du bassin de Bersabée — Rupture de pente entre le haut massif et le désert de Juda — Ouadi es-Sikke — Bethléem — Ouadi es-Sura Taamra.

*23. Terminaison du désert de Juda près Jéricho.* — Zone de collines sénoniennes et de dépressions alluviales.

*24. Désert de Juda septentrional.* — Bordure du haut massif — Ouadi es-Sura Taamra — Bordure du Ghor et de la Mer Morte.

*25. Désert de Juda méridional.* — Bordure du haut massif — Ouadi es-Sura Taamra — Contact de la Mer Morte ou de ses plaines côtières — Contact du bassin de Bersabée et ligne droite tirée de Bersabée au sommet de Ras Zuweira et prolongée jusqu'à la Mer Morte.

*26. Plaine côtière. Partie septentrionale.* — Méditerranée — Limite des alluvions quaternaires — Ligne droite tirée de Toul Karem à la mer.

*27. Plaine côtière. Partie centrale.* Méditerranée — Ligne de Toul Karem à la mer — Limite des alluvions quaternaires — Route Jaffa à Bab el-Ouad.

*28. Plaine côtière. Partie méridionale.* — Méditerranée — Route Jaffa-Bab el-Ouad — Contact de la Sephela — Ligne droite tirée de Gaza à Bersabée.

*29. Bassin de Bersabée.* — Ligne Gaza-Bersabée et Bersabée-Ras Zuweira prolongée jusqu'à la Mer Morte. — Contact Cénomamien-Sénonien.

*30. Dépression du Jourdain (de la plaine de Beisan à Sartabé).* — A l'Ouest et à l'Est, limite des alluvions quaternaires — Limite méridionale de la plaine de Beisan — Ligne Est-Ouest, tangente à l'éperon sud de Sartabé.

*31. Dépression du Jourdain (de Sartabé à la pointe nord de la Mer Morte)* (Plaine de Jéricho). — A l'Ouest et à l'Est, limite des alluvions quaternaires — Ligne passant par l'éperon sud de Sartabé — Ligne tangente à la pointe nord de la Mer Morte.

*32. Plaines côtières de la Mer Morte.*

*33. Péninsule de la Lisan.*

*34. Mer Morte.*

## ANNEXE II

### DÉFINITIONS DES CARACTÉRISTIQUES MORPHOMÉTRIQUES EMPLOYÉES

*1. Courbe hypsographique.* — Courbe représentant la distribution des superficies par tranches d'altitude. Les surfaces sont portées en abcisse et cumulées à partir du point origine; les altitudes sont marquées en ordonnées.

*2. Altitude maximum.* — Altitude la plus élevée de la région considérée.

*3. Volume ou cylindre encadrant.* — C'est le volume (pratiquement toujours un cylindre droit) qui a pour base la surface de la région considérée et pour hauteur l'altitude maximum de celle-ci.

*4. Altitude moyenne.* — C'est l'altitude d'un cylindre qui a même base et même volume que la région considérée.

*5. Massivité d'une région. Coefficient de massivité.* — La massivité d'une région est le rapport existant entre le volume de son relief et celui du cylindre enveloppant. Ce rapport s'appelle *coefficient de massivité.* Il s'exprime en pourcentage. Il est égal au rapport de l'altitude moyenne à l'altitude maximum.

A. La massivité d'une région est *totale* quand elle atteint 100 %. L'altitude moyenne est alors égale à l'altitude maximum. Cela peut être le cas d'une plaine, d'un plateau ou d'un horst.

B. La massivité d'une région est *parfaite* quand elle atteint le maximum de volume compatible avec le type de relief considéré.

*6. Aération d'une région. Coefficient d'aération.* — Non seulement une région n'atteint jamais une massivité totale du fait de l'érosion, mais encore sa structure dès le point de départ en diffère la plupart du temps de manière considérable. Le *volume d'aération* consiste dans le volume du cylindre enveloppant diminué du volume de la région. Il est proportionnel à la différence existant entre l'altitude maximum et l'altitude moyenne.

Deux influences jouent dans le volume d'aération: la structure et l'érosion. Il faut les distinguer soigneusement.

A. *Le volume d'aération structurale.* C'est le volume du cylindre enveloppant diminué du volume de la région avant toute action érosive. Il est proportionnel à l'altitude maximum originelle diminuée de l'altitude moyenne originelle.

B. *Le volume d'aération érosive.* C'est le volume déjà déblayé par l'érosion.

*Tableau de base*

| Régions | −392/ −250 | −250/ 0 | 0/ 250 | 250/ 500 | 500/ 750 | 750/ 1000 | >1000 | Total (A ou B) | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | — | — | 297 | — | — | — | — | — | 297 |
| 2 | — | — | 132 | 176 | 254 | 115 | 11 | — | 688 |
| 2 A | — | — | 117 | 104 | 146 | 50 | 6 | 423 | — |
| 2 B | — | — | 15 | 72 | 108 | 65 | 5 | 265 | — |
| 3 | — | 22 | 421 | 302 | 15 | — | — | — | 760 |
| 3 A | — | — | 310 | 230 | 7 | — | — | 547 | — |
| 3 B | — | 22 | 111 | 72 | 8 | — | — | 213 | — |
| 4 | — | — | 434 | — | — | — | — | — | 434 |
| 4 A | — | — | 389 | — | — | — | — | 389 | — |
| 4 B | — | — | 45 | — | — | — | — | 45 | — |
| 5 | — | 61 | 315 | 63 | 1 | — | — | — | 440 |
| 5 A | — | — | — | 3 | — | — | — | 3 | — |
| 5 B | — | 61 | 315 | 60 | 1 | — | — | 437 | — |
| 6 | — | — | 173 | 7 | — | — | — | — | 180 |
| 6 A | — | — | 105 | 7 | — | — | — | 112 | — |
| 6 B | — | — | 68 | — | — | — | — | 68 | — |
| 7 | — | — | 16 | — | — | — | — | — | 16 |
| 7 A | — | — | 7 | — | — | — | — | 7 | — |
| 7 B | — | — | 9 | — | — | — | — | 9 | — |
| 8 | — | 24 | 40 | 32 | — | — | — | — | 96 |
| 8 A | — | 17 | 36 | 32 | — | — | — | 85 | — |
| 8 B | — | 7 | 4 | — | — | — | — | 11 | — |
| 9 | — | 164 | — | — | — | — | — | — | 164 |
| 9 A | — | 97 | — | — | — | — | — | 97 | — |
| 9 B | — | 67 | — | — | — | — | — | 67 | — |
| 10 | — | 42 | — | — | — | — | — | — | 42 |
| 10 A | — | 17 | — | — | — | — | — | 17 | — |
| 10 B | — | 25 | — | — | — | — | — | 25 | — |

*Tableau de base*

| Régions | −392/ −250 | −250/ 0 | 0/ 250 | 250/ 500 | 500/ 750 | 750/ 1000 | >1000 | Total (A ou B) | Total |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 20 | 105 | — | — | — | — | — | — | 125 |
| 11 A | 7 | 37 | — | — | — | — | — | 44 | — |
| 11 B | 13 | 68 | — | — | — | — | — | 81 | — |
| 12 | 55 | 178 | — | — | — | — | — | — | 233 |
| 12 A | 16 | 137 | — | — | — | — | — | 153 | — |
| 12 B | 39 | 41 | — | — | — | — | — | 80 | — |
| 13 | — | 62 | — | — | — | — | — | — | 62 |
| 14 | — | — | 141 | 87 | 4 | — | — | — | 232 |
| 15 | — | — | 159 | 60 | — | — | — | — | 219 |
| 16 | — | — | 106 | 64 | 4 | — | — | — | 174 |
| 17 | — | — | 171 | 500 | 101 | 5 | — | — | 777 |
| 17 A | — | — | 147 | 395 | 69 | 3 | — | 614 | — |
| 17 B | — | — | 24 | 105 | 32 | 2 | — | 163 | — |
| 18 | — | 114 | 238 | 119 | 44 | 2 | — | — | 517 |
| 19 | — | — | 413 | 382 | 92 | 7 | — | — | 894 |
| 19 A | — | — | 413 | 382 | 89 | 7 | — | 891 | — |
| 19 B | — | — | — | — | 3 | — | — | 3 | — |
| 20 | — | 12 | 45 | 287 | 696 | 285 | 2 | — | 1327 |
| 20 A | — | — | — | 191 | 473 | 192 | — | 856 | — |
| 20 B | — | 12 | 45 | 96 | 223 | 93 | 2 | 471 | — |
| 21 | — | — | 457 | 718 | — | — | — | — | 1175 |
| 22 | — | — | — | 43 | 491 | 475 | 7 | — | 1016 |
| 22 A | — | — | — | 43 | 395 | 289 | 5 | 732 | — |
| 22 B | — | — | — | — | 96 | 186 | 2 | 284 | — |
| 23 | — | 56 | — | — | — | — | — | — | 56 |
| 24 | 9 | 68 | 181 | 151 | 40 | — | — | — | 449 |
| 25 | 18 | 52 | 122 | 384 | 293 | — | — | — | 869 |
| 25 A | — | — | — | — | 35 | — | — | 35 | — |

*Tableau de base*

| Régions | −392/ −250 | −250/ 0 | 0/ 250 | 250/ 500 | 500/ 750 | 750/ 1000 | >1000 | Total (A ou B) | Total |
|---|---|---|---|---|---|---|---|---|---|
| 25 B | 18 | 52 | 122 | 384 | 258 | — | — | 834 | — |
| 26 | — | — | 375 | — | — | — | — | — | 375 |
| 27 | — | — | 686 | — | — | — | — | — | 686 |
| 28 | — | — | 1581 | — | — | — | — | — | 1581 |
| 29 | — | — | 22 | 264 | 91 | — | — | — | 377 |
| 30 | 143 | 103 | — | — | — | — | — | — | 246 |
| 30 A | 48 | 38 | — | — | — | — | — | 86 | — |
| 30 B | 95 | 65 | — | — | — | — | — | 160 | — |
| 31 | 442 | 93 | — | — | — | — | — | — | 535 |
| 31 A | 223 | 44 | — | — | — | — | — | 267 | — |
| 31 B | 219 | 49 | — | — | — | — | — | 268 | — |
| 32 | 101 | 11 | — | — | — | — | — | — | 112 |
| 32 A | 65 | 5 | — | — | — | — | — | 70 | — |
| 32 B | 36 | 6 | — | — | — | — | — | 42 | — |
| 33 | 85 | — | — | — | — | — | — | — | 85 |
| 34 | 961 | — | — | — | — | — | — | — | 961 |
| 34 A | 521 | — | — | — | — | — | — | 521 | — |
| 34 B | 440 | — | — | — | — | — | — | 440 | — |
| 35 | 5 | 73 | 208 | 340 | 128 | — | — | — | 754 |
| 36 | — | — | 2 | 50 | 110 | 16 | — | — | 178 |

N. B. Le planimétrage des différentes régions de la Palestine, tel qu'il est résumé dans ce tableau, a été établi par le Centre de Documentation Cartographique de l'Institut de Géographie de Paris.
Quand une région est traversée par la ligne de partage des eaux ou par le Jourdain, la lettre A indique la partie occidentale et la lettre B la partie orientale.

## VERSANT MÉDITERRANÉEN

### *1° Massif galiléen*

| Numéros de référence à la carte | Régions | -392 -250 | -250 0 | 0 250 | 250 500 | 500 750 | 750 1000 | > 1000 | Total | Altitude maxim. | Par rapport à la Mediterranée Alt. moy. | Par rapport à la Mediterranée Coeff. de massiv. | Par rapport à la Mer Morte Alt. moy. | Par rapport à la Mer Morte Coeff. de massiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *25+7+6* | Galilée libanaise | — | — | 209 | 243 | 331 | 97,5 | — | 880,5 | 943 | 454 | 48% | | |
| 1+2A+3A | Galilée palestinienne | — | — | 724 | 334 | 153 | 50 | 6 | 1267 | 1208 | 277 | 22% | | |
| *25+7+6* 1+2A+3A | Galilée | — | — | 933 | 577 | 484 | 147,5 | 6 | 2147,5 | 1208 | 351 | 28% | | |
| 4A+5A | Dépression médiane | — | — | 389 | 3 | — | — | — | 392 | 515 | 178 | 34% | | 62% |
| | Gal. + Dépr. médiane | — | — | 1322 | 580 | 484 | 147,5 | 6 | 2539,5 | 1208 | 323 | 26% | | 44% |

### *2° Massif palestinien*

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26+14+15 16+17A | Ht. pays septentr. | — | — | 928 | 606 | 77 | 3 | — | 1614 | 940 | 244 | 25% | | |
| 27+19A+20A | Ht. pays central | — | — | 1099 | 573 | 562 | 199 | — | 2433 | 1016 | 309 | 36% | | |
| 28+21+22A 29+25A | Ht. pays méridional | — | — | 2060 | 1025 | 521 | 289 | 5 | 3900 | 1020 | 314 | 30% | | |
| | Total: | — | — | 4087 | 2204 | 1160 | 491 | 5 | 7947 | 1020 | 316 | 31% | | |

## II. VERSANT DU JOURDAIN

### *1° Massif galiléen*

## II. VERSANT DU JOURDAIN

### *1° Massif galiléen*

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6A+2B+8A 3B+10A | Galilée | — | 56 | 267 | 183 | 116 | 65 | 5 | 692 | 1208 | 372 | 30% | 331 | 45% |
| 4B+5B 11A+13+12A | Dépression médiane | 23 | 297 | 360 | 60 | 1 | — | — | 741 | 515 | 161 | 31% | 31 | 46% |
| | Galilée et depr. méd. | 23 | 353 | 627 | 243 | 117 | 65 | 5 | 1433 | 1208 | 287 | 23% | 176 | 35% |

### *2° Massif palestinien*

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17B+18+30A | Partie septentrionale | 48 | 152 | 262 | 224 | 76 | 4 | — | 766 | 940 | 293 | 31% | 158 | 41% |
| 19B+20B 23+24+31A | Partie centrale | 232 | 180 | 226 | 247 | 266 | 93 | 2 | 1246 | 1016 | 444 | 43% | 219 | 43% |
| 22B+25B+32A | Partie méridionale | 83 | 57 | 122 | 384 | 354 | 186 | 2 | 1188 | 1020 | 572 | 56% | 426 | 57% |
| | Total: | 363 | 389 | 610 | 855 | 696 | 283 | 4 | 3200 | 1020 | 416 | 40% | 286 | 47% |

# The Pattern of Settlement in Palestine*

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## THE PATTERN OF SETTLEMENT IN MOUNTAINS AND PLAINS

TAKING into account the natural conditions of Palestine[29] one would expect the majority of settlements to be in the plains and a smaller number in the uplands. The first detailed map of the country, however, that of the Survey of Western Palestine directed by Conder and Kitchener in 1871-77, shows exactly the contrary. It is evident then that this pattern of settlement (cf. map, Fig. 3) is highly anomalous, and demands explanation. The distribution is even more peculiar if one considers that some of the earliest known inhabitants of Palestine lived in the plains and not in the mountains, for example the palaeolithic cave dwellers at the foot of Mount Carmel near 'Atlit, or the Bronze Age settlers of the lowermost Jordan Valley north of the Dead Sea.

These remarks apply equally to urban and to rural settlement. To take towns first, there is a remarkable difference in the stability of settlement between the towns of the coastal plain and those of the mountains. The old towns of the mountain area are, from south to north: Beersheba, Hebron, Bethlehem, Jerusalem, Beeroth-el-Bireh with its much younger sister-town Ramallah, Sichem-Nablus, Samaria-Sebaste, Jenin, Beth-Shan, Nazareth, Sepphoris-Zippori, Safed. With two exceptions these mountain towns have existed without interruption, though fluctuating in importance and number of population. The two exceptions, significantly enough, are Beersheba and Beth-Shan,—i.e. those two towns which, although situated within the mountain region, are located in basins intersecting it.[30] It is significant, furthermore, that there is no

* Continued from *Israel Exploration Journal*, 3, 1953, pp. 65-78.

[29] Supra, pp. 66-67.

[30] Beersheba was deserted during the centuries following the Arab conquest of the country. It was founded anew by the Ottoman Government in 1900.—The history of Beth-Shan too is marked by extreme fluctuations. From 358 to 640 it was the capital of Palaestina Secunda, but thereafter its importance declined. During the nineteenth century it was but a miserable hamlet with a mixed population of Arab fellahin, Beduin, and Egyptians: the latter had only recently arrived at Beth-

difference between this list and today's list of towns in the uplands, except for Samaria-Sebaste and Sepphoris-Zippori which by now have shrunk to large villages, and Beit Jala opposite Bethlehem and Ramallah which have only grown to the size of towns during the present century. Apart from Beit Jala no new mountain town has been added to the list.[31] With mountain towns the keynote is stability.

The settlement history of the towns of the coastal plain is quite different. From south to north we find in the plain the ancient towns of Gaza, Ascalon, Jaffa, Lod (Lydda), Arsuf- Apollonia, Caesarea, Dor-Tantura and Acre. Of these, Ascalon has been superseded for seven centuries by nearby Migdal-Ashkelon, a rather mediocre successor, in fact no more than a large village. Tantura likewise has long been relegated to the rank of a village of average size. Apollonia ceased to be inhabited at all, and so did Caesarea until it was resettled by Bosnians in 1884. That is to say, out of eight old towns two had ceased to exist and two more had shrunk to villages: four only maintained their civic status. This list, moreover, is no longer representative of the towns of the coastal plain today. After the Arab conquest Ramle was founded as a rival to nearby Lydda and to Jaffa. During the nineteenth century Haifa rose from an insignificant village at the south end of the Bay of Acre to a city. During the present century as part of the revival of the country by Zionist settlement, a number of initially agricultural settlements of the coastal plain emerged as small towns: Rehovot, Rishon le-Zion, Petah Tiqva, Herzlia, Hedera, Naharia, whereas Ramat Gan on the outskirts of Tel Aviv and Natanya were founded as cities. After World War I Tel Aviv, a new suburb of Jaffa, dwarfed this latter town and quickly grew to the rank of the *primate* city of the country. There are today eighteen[32] towns in the coastal plain as against the eight ancient ones.

These conditions may be summarized in the following table:

Shan and revived the obsolescent village. U.J. Seetzen: *Reisen durch Syrien, Palästina, Phönicien, die Transjordan-Länder, Arabia Petraea und Unter-Aegypten*, II. Berlin, 1854, p. 163, visited it in 1806 and found here some twenty habitations, part of them built of reedwalls. The *Survey of Western Palestine, Mem.* II, p. 83, describes here in 1873 'a miserable hamlet of some 60 mud cabins', showing but very little improvement during seventy years.

[31] The one other new town—'Affule—is situated not in the mountains proper but in 'Emeq Jezreel, an intersecting basin, and is similar in situation to its neighbour Beth-Shan.

[32] Or even nineteen if Tel Aviv and Jaffa are counted separately.

STABILITY OF TOWNS IN MOUNTAINS AND COASTAL PLAIN

| | Total No. of towns | Towns throughout history | Temporarily reverted to villages | Ceased to be inhabited | | Newly settled | Settled throughout history | Non-permanent settlements |
|---|---|---|---|---|---|---|---|---|
| | | | | tempo-rarily | perma-nently | | | |
| Mountain Region | 15 | 8 | 4 | 2 | 0 | 1 | 12 | 3 |
| do. in % | 100 | 53 | 27 | 13 | 0 | 7 | 80 | 20 |
| Coastal Plain | 18 | 4 | 2 | 1 | 1 | 9 | 7 | 11 |
| do. in % | 100 | 22 | 11 | 6 | 6 | 50 | 39 | 61 |

A comparison of the second column with the last two shows clearly the prevalence of continuous settlement and the urban stability of the upland-towns as against the high degree of fluctuation and variability of those in the coastal plain. Quite in keeping with the general degree of fluctuation of habitation the coastal towns display extreme variations in size. Four of them attained for certain periods the rank of the first city of the country: Tel Aviv, Ramle, Caesarea, Acre. Among the mountain towns Jerusalem only held this rank repeatedly.[33] Most illuminating because of their outstanding importance for short periods only are the cases of Caesarea and Haifa. Caesarea,[34] founded in 22 B.C., became under Roman rule the largest town of the country. Its decay set in in the eleventh century and its destruction in the twelfth century by Salah ed-Din, Baybars and el-Ashraf successively led to its eventual abandonment. Haifa, an obscure village throughout most of history, overtook its neighbour Acre only during the first decade of the present century, and developed into the main port and the most important industrial centre of the country.

Summing-up we may use the varying importance of coastal and upland towns as a yardstick of security conditions and economic development in the country. Whenever a satisfactory state of regional development[35] and public security permitted the organic utilization of the different parts of the country, the coastal plain gained supremacy and the leading city was a city of the plain. Whenever conditions in the country deteriorated and settlement in the coastal plain became marginal, its towns decreased in importance, the upland towns gained in relative importance, and the role of the most important city of the

[33] Samaria was the capital of the kingdom of Israel, and Beth-Shan the capital of Palaestina Secunda. But it does not seem that they attained the rank of the *primate* city, i. e. the most important city of the country economically and demographically.

[34] Cf. A. Reifenberg: Caesarea: a Study in the Decline of a Town, *IEJ*, 1, 1950-51, pp. 20-32.

[35] This includes not only adequate security conditions but proper sanitation, drainage, an adequate supply of water and other essential factors.

country reverted to Jerusalem, without any necessary increase in its population.

In assessing these fluctuations in importance between mountain towns and those of the coastal plain two factors should be taken into account: Firstly city populations are much more mobile than villagers. A considerable percentage of them may move within a few years in response to more favourable conditions, mainly economic ones. The case of Jerusalem well illustrates this. During the later years of British Mandatory rule, political relations in Jerusalem became more strained than elsewhere in Palestine, and security restrictions were more stringent. This brought about the movement of a certain number of people and a not inconsiderable volume of business from Jerusalem to the coastal towns. The process was intensified immediately after the siege of Jerusalem, to be gradually reversed later on. A much more characteristic case, from outside Palestine, is California, whose population in the special conditions of World War II grew from 1940 to 1950 by 3.68 millions or 53%, including Los Angeles which grew by 30% or 453,514 inhabitants during that period. The second factor to be remembered is that times which brought about the development of the largest cities in the coastal plain were times of economic prosperity which brought a considerable influx of merchants and traders as well as administrative personnel from abroad. In times of depression and transfer of the important urban centres to the uplands a considerable number of these people would leave the country.

## RURAL SETTLEMENT: ITS DEGREE OF STABILITY IN MOUNTAINS AND PLAINS

It has been shown that the keynote of mountain towns is continuity, and that of the towns of the coastal plain fluctuation. These trends become much more pronounced if we analyse the degree of continuity of rural settlement.

Research in archaeology and historical geography has produced ample evidence to show that a large number—and probably the large majority—of present-day village sites in the uplands of Palestine are the successors *in loco* of settlements known from Biblical times and very often mentioned in the Bible itself,—i.e. dating back to the second millenium B.C. This is quite in keeping with the general rule that roads and sites of settlements are the most conservative human elements in a landscape.

A comparison of the two maps showing the distribution of settlements in 1875 (Fig. 3) and 1952 (Fig. 4) is self-explanatory. On the whole there is very little difference between the distribution of settlements in the mountain area eighty years ago and today. Large parts of the coastal plain, however, were devoid of settlements in 1875. The coastal plain had suffered long continued deterioration which had led to the development of extensive swamp areas—first sea-

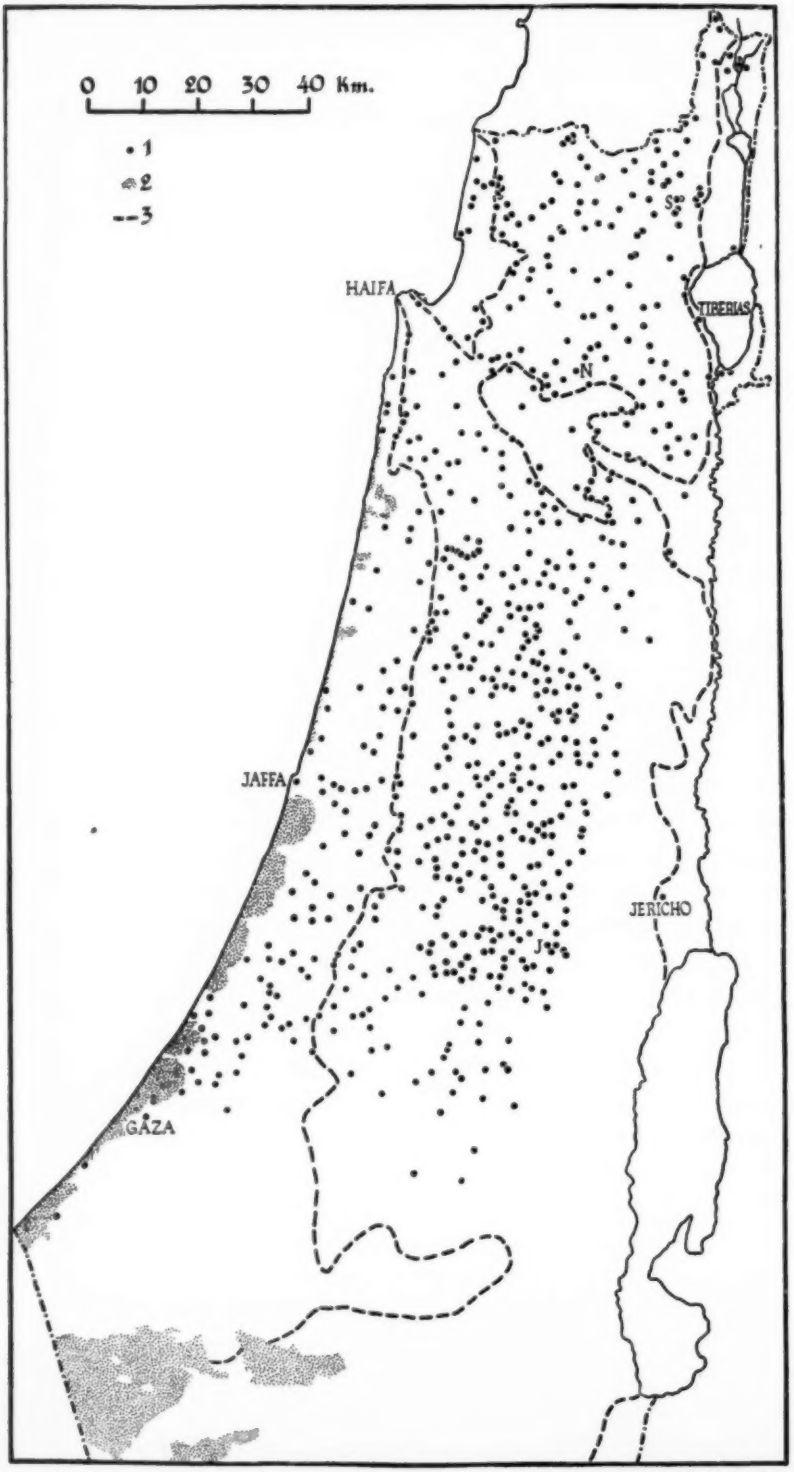



Fig. 3. Settlements in 19
according to *Survey of W*
*Palestine.*

1—Village;

2—Dunes;

3—Border-line between plains and mountains

J—Jerusalem,

N—Nazareth,

S—Safed.

*(Drawn by M. Seydewitz)*



g. 4. Settlem

Settlements
1875, cf. Fi

Settlements
1875-1952;

Dunes.

Jerusalem,

Nazareth,

Safed.

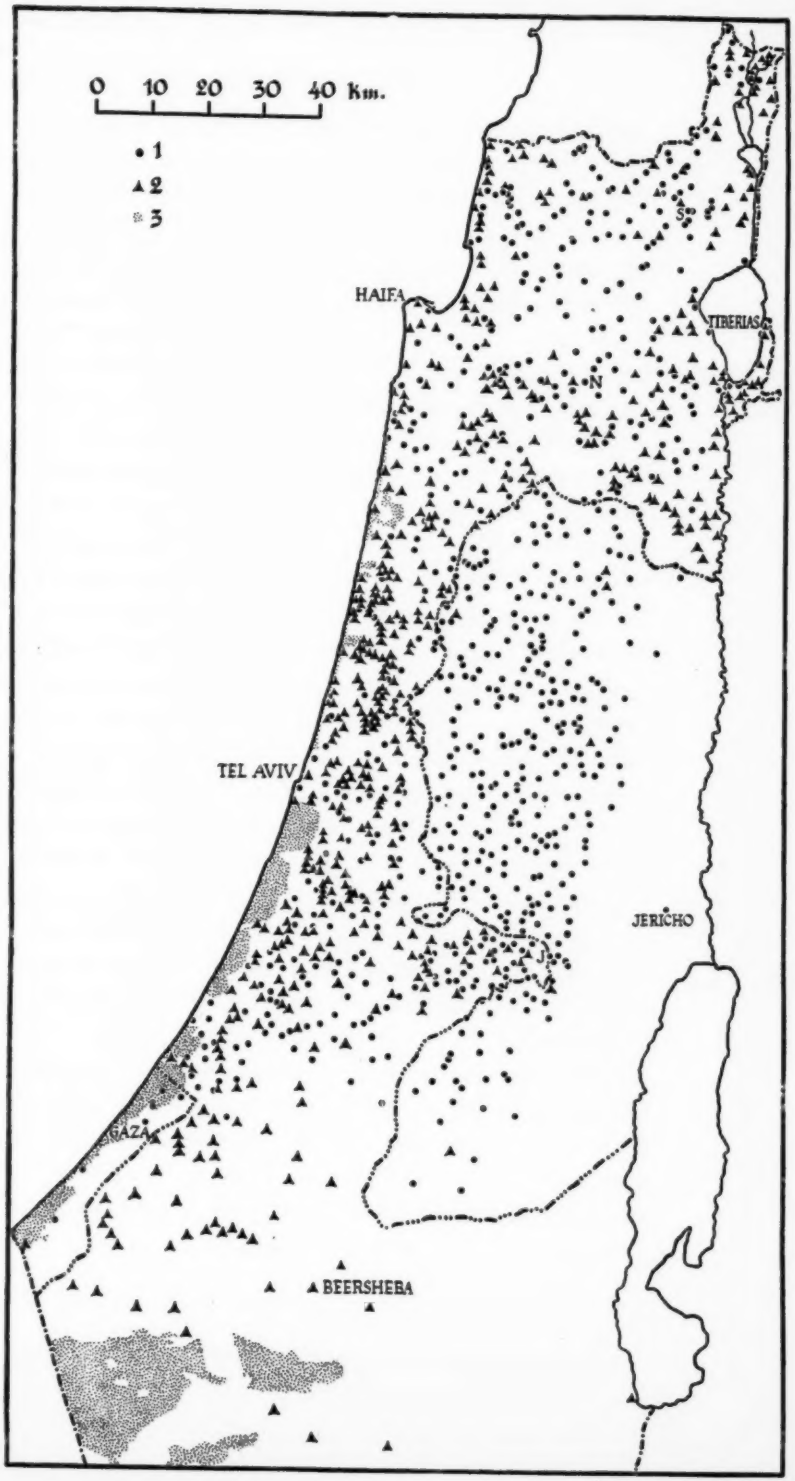



Fig. 4. Settlements in 1952.
1 – Settlements existing in 1875, cf. Fig. 3;
2 – Settlements founded 1875-1952;
3 – Dunes.
J – Jerusalem,
N – Nazareth,
S – Safed.

*(Drawn by M. Seydewitz)*

sonal and later permanent—, and to the general prevalence of malaria. No less detrimental were the ravages of the many armies which had passed along this main highway of the country—the *via maris*—during prolonged times of unrest and war. All these reasons brought about the gradual withdrawal of the population into the adjacent uplands, as conditions in the plains became more and more unbearable. The result of this process is shown in the map for 1875.

## THE PLAIN OF SHARON

The most outstanding example of cultural regression in Palestine is that of the central part of the coastal plain, the Plain of Sharon, during the last century. Schwöbel, writing some forty years ago, said: 'Nowhere is the coastal plain of Palestine so abundant in water, and at the same time so unhealthy, as in its central sector.'[36] It included a long stretch of swamps of which those of the Faliq were the most extensive. The maps prove that it was nearly empty in 1875 as compared with its dense covering of settlements today. When in 1799 Napoleon invaded Palestine to conquer Acre, the French army avoided the unhealthy coastal plain by marching on the narrow stretch between the shore and the foot of the coastal cliff—a most risky operation from a military point of view.[37] But there is no doubt that Napoleon correctly appreciated the situation: he was taking the lesser risk by passing through a long defile than he would have taken by marching along the *via maris* through the coastal plain and thereby endangering the health of his troops. All this refers to the same plain at whose northern end once stood the city of Caesarea, in its time by far the largest city of the country; Caesarea was evidently based on a flourishing and productive hinterland nearby. This same part of the coastal plain furthermore is today more flourishing and has a denser rural population than any other part of the country.

As the centuries passed and deterioration progressed, not only invading armies avoided the coastal plain but the local population withdrew from it as well. In the nineteenth century, as a result, a large number of foreign elements drifted into the region: Turkomans, Circassians, Bosnians, Negroes and half-castes—the latter descended from liberated slaves of East-African origin, made up a composite mixture of population; some of them led

[36] V. Schwöbel: Samarien: Das westpalästinensische Mittelland, *ZDPV*, 53, 1930, pp. 1-47, 89-135. Ref. p. 47.

[37] M. Jacotin: *Carte topographique de l'Egypte et de plusieurs parties des pays limitrophes.* Paris, 1810.

a nomadic life. The area was No Man's Land to such a degree that the Ottoman Government considered it as the property of the Sultan and only after 1870 permitted the registration of land-titles in the name of private landowners. The semi-nomadic Beduin tribe 'Arab Abu Kishk lived on what is at present the outskirts of Tel Aviv almost until the second World War. The population which once inhabited the villages of the coastal plain withdrew to the mountains. Occupation of the coastal plain became largely a branch of mountain settlement. The peasants who had moved to the mountains maintained contact with their lands in the plain and—if and when conditions permitted—they made use of these lands. The length of the period for which they went down to cultivate their lands or graze stock there depended on conditions, mainly of health and security. In the plains there were small hamlets or just a few miserable houses or mud hovels. Most of them were occupied seasonally only. Some were occupied 'as an 'Azbeh, or summer residence for those in charge of the herds and flocks sent down to graze on the plain'.[38]

Clear evidence of the relation between upland villages and plain lands is preserved in the names of certain *khirab* (ruined sites or temporarily occupied hamlets) or those of stretches of land in the plain and their counterparts—inhabited villages in the uplands. The map (Fig. 5) and the table on page 200 give the details of these 'pairs' of names, one referring to a mountain village and the other one to a place in the coastal plain.

To sum up, we find extreme fluctuation of settlement in the coastal plain and most particularly in the Plain of Sharon. It may not be altogether accidental that the two ancient towns whose habitation ceased completely—Apollonia and Caesarea—were the two towns of Sharon. The underlying reasons for this discontinuous type of settlement are fairly well understood. Along the *via maris*, the major coastal highway of Palestine, passed not only most of the commercial but most of the military traffic of the country. This brought to the coastal plain all the ravages of war which to a great extent did not affect the nearby mountain region.[39] It was not only the destruction of war that travelled along this coastal highroad but severe epidemics as well. George Adam Smith drew attention to the repeated epidemics of plague which had invaded Palestine from Egypt along the coastal road.[40] Planned destruction too befell the coastal

[38] *Survey of Western Palestine, Mem.* II., p. 135.
[39] Cf. H. D. Schmidt: Palestine Trends of Power, *JNES*, 10, 1951, pp. 1-12, Ref. p. 2.
[40] G. A. Smith: *The Historical Geography of the Holy Land.* 26th ed. London, 1935, pp. 155-158.

Fig. 5. I—Vill… V—Up…

settlem… order … gainin… donme… natura… with s… of swa… On the… proved… tained … man in… state, b… In d… (later o… icance … settlem… it agai…

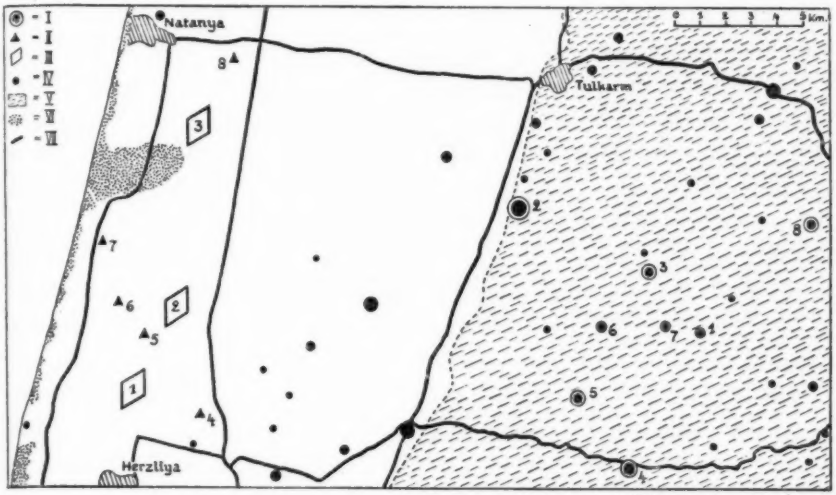
[42] A. Rei…

| No.-Reference to the map | MOUNTAIN VILLAGE | | | | | LOCALITY IN THE PLAIN | | | | | | Distance between mountain- and plain-village in km., as the plane flies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | Map Reference | Altitude in m. | Population 1922[41] | Population 1931[42] | Name | Map Reference | Altitude in m. | Reference in *Survey of Western Palestine, Mem.* II, page | Description, *ibid.* | Status in 1944, according to *Palestine, Index Gazetteer* | Remarks | |
| 1 | Kafr 'Abbush | 158181 | 310 | 263 | 360 | Ghabat[43] el-'Ababisha | 135178 | 50 | — | — | Land Registration Unit | — | 22 |
| 2 | et-Taiyiba | 151185 | 80 | 2350 | 2944 | Ghabat et-Taiyiba | 136181 | 45 | — | — | do. | — | 14 |
| 3 | Kafr Sur | 156183 | 280 | 271 | 559 | Ghabat Kafr Sur | 137187 | 20 | — | — | do. | The Census Report for 1931 cites here as inhabited dependant village: Baiyara Hanun, reference 137188 | 19 |
| 4 | 'Azzun | 155175 | 260 | 700 | 994 | Kh. 'Azzun (Tabsur) | 138177 | 35 | 135 | mud hamlet of moderate size | hamlet | | 17 |
| 5 | Jaiyus | 153178 | 230 | 433 | 569 | Kh. Jaiyus | 136180 | 30 | 135 | a few mud hovels occupied in summer by shepherds | several houses | | 17 |
| 6 | Kafr Jammal | 154181 | 190 | 396 | 498 | Kh. Kafr Jammal | 135182 | 20 | — | — | single house | — | 19 |
| 7 | Kafr Zibad | 156181 | 290 | 260 | 469 | Kh. ez-Zababida | 134184 | 10 | 141 | a small modern ruined village | hamlet | — | 22 |
| 8 | Beit Lid | 162185 | 420 | 652 | 738 | Kh. Beit Lid | 140191 | 40 | 135 | a small mud hamlet, named El Mughair | Village of 75 houses (1931). Population: 1922—206, 1931—298 | | 23 |
| | Another, doubtful, pair are: | | | | | | | | | | | | |
| 9 | Zalafa[44] | 167217 | 225 | 156 | 198 | Kh. Zalafa | 144201 | 30 | 153 | a very small hamlet | village | Population 1922-63. In 1931 it was incorporated with 'Attil. | 27 |

[41] J. B. Barron: *Palestine—Report and General Abstracts of the Census of 1922.* Jerusalem, 1923.

[43] E. Mills: *Census of Palestine 1931. Population of Villages, Towns and Administrative Areas.* Jerusalem, 1932.

[43] *Ghabat* means "lands of..." [44] Described in *Survey of Western Palestine, Mem.* II, p. 72, as 'a ruined village on a hill'.




*(Drawn by M. Seydewitz)*

Fig. 5. Mountain villages and their counterparts in the Plain of Sharon.
I—Village, cf. table on p. 200; II—*Khirba;* III—Land-unit; IV—Other villages; V—Upland area; VI—Dunes; VII—Main roads.

settlements. The Mamluks deliberately destroyed the coastal towns in order to prevent the European Christian powers from maintaining and regaining a foothold on the coast of the Holy Land. The destruction and abandonment of towns and villages brought about the neglect of drainage, both natural and artificial, and at the same time the river-beds continued to be choked with soil eroded from the mountains. This caused the increasing development of swamps behind the barrier of recent and old dunes in the coastal plain.[45] On the whole the story is typical of areas where natural drainage has been improved by man. If the new or altered drainage channels are not properly maintained the area deteriorates severely. There is no return to the *status quo,* once man interferes with nature: the land is either better or worse than in its natural state, but can no longer be the same.

In distinction to Roman times, when Caesarea was the capital of Judaea (later on Provincia Syria Palaestina), the coastal plain had reverted to insignificance by the nineteenth century and the uplands were the important area of settlement. Zionist colonisation reclaimed the coastal plain and settled it again. Settlement progressed from the margins, reaching last the Faliq

[45] A. Reifenberg: *The Struggle between the Desert and the Sown.* Jerusalem, 1950, pp. 50-51 (Hebrew).

swamps in the centre. The gradual shifting of the centre of settlement from the mountains to the plain is paralleled by the westward shift of the main modern coastal highway (cf. map, Fig. 5). In 1920 there was as yet no direct metalled road connecting Tel Aviv and Haifa; one had to travel a long detour through the mountains, either by Jerusalem-Nablus-Jenin-Nazareth, or by Qalqiliya-Tulkarm-Jenin-Nazareth. In 1937 only, the central highway by Petah Tiqvah-Hedera-Zikhron Ya'aqov Station was added. And in 1950 a modern highway still nearer the coast followed, leading from Tel Aviv directly north to Natanya. This westward movement of the main road closely followed the trend of settlement and is characteristic of the present shift of the centre of activity and settlement in the country back to the coastal plain.[46]

It would appear that the degree of instability and fluctuation in the development of the Sharon is stronger than in other parts of the coastal plain. The reasons for this are not yet fully understood. Contributing factors are: its narrowness as compared with the southern coastal plain, and the narrowness of the dune belt (generally less than 1 km. wide, as against over 5 km. in the south)—both reasons making it more vulnerable, and aggravating the effect of damage caused to it. This includes not only damage by war but no less by swamping, as the adverse effects of improper drainage, such as severe infestation with malaria and extreme deterioration of soils, would affect here the whole area and not only parts of it as in the south.

## MOUNTAIN VILLAGES

The plains of Palestine, and amongst them the coastal plain, are the most valuable part of the country if man makes proper use of them. But they are very sensitive too and settlement here has therefore been very unstable and has fluctuated in amount and importance.

The mountains are much less promising for the agriculturist. Development here has been less spectacular but much more steady. Settlement too has been more steady: continuity is its characteristic, both for sites and even for size of settlements.

There are significant differences between the sites of settlements in the different regions of the uplands. Villages in Judaea generally prefer the highest topographical location for sites. These include hill-top sites (acropolis-type),

[46] The author is indebted to his colleague Y. Karmon who drew his attention to these developments in the field.

ridge, spur and saddle (col). Villages sited on slopes or on terraces are not infrequent, but hardly any village in Judaea is built down below on the valley bottom. There are two reasons for the elevated locations of village sites. The one is to be found in the surface features of Judaea, whose relatively broad upland surfaces attract cultivation to higher elevations, and settlements with it. The narrow and deeply dissected valleys on the other hand are not attractive for the location of villages.[47] The second reason is security: it is desirable and at times even imperative to site villages at a place providing strategic command of the surrounding area. The extent to which security takes precedence over other considerations is illustrated by the relation between the village and the spring (or springs) supplying its water. There are villages in Judaea built a hundred metres and more above their springs,[48] and to this very day the women have to carry the water required for domestic use all the way up to the village.

There is much less preference for elevated village sites in Samaria and in Galilee. Although a considerable number of villages in these regions is to be found at high elevations as well, slope sites become more frequent, and locations on valley grounds become quite frequent too. In Samaria and Lower Galilee the reason for this is to be found in the tectonic pattern of the country, which formed a considerable number of small intermontane basins (e.g. those of Beth Netofa and Dothan, Marj Sanur, etc.) and long broad valleys (e.g. Sahl Mukhnah E of Nablus). All these broad valleys and their sometimes deep alluvial soil attract lines and clusters of settlements along their edges.

In Upper Galilee villages at high elevation become again prevalent. Only in the central part of it, distinguished by parallel ridges and valleys running towards the NE, are a few villages found on the broad valley-grounds or on the lower slopes. In Western Upper Galilee with its long-drawn E-W spurs nearly all the villages are situated on the crests of the spurs. Eastern Upper

[47] Cf. supra, p. 67.

[48] The women of Beit Surik NW of Jerusalem have to carry up their water from a fine spring 85 m. below the village. Those of Beitillu carry the water up from a spring on the opposite slope entailing an ascent of 75 m. The spring of Janiya is 60 m. below the village. 'Ein Maḥtush is 100 m. below Khirbet el-'Umur and at a distance of 750 m. from the village. The extreme case is probably that of the little village of Ras Karkar perched on a rock 150 m. above its spring. In all these places the women carry the water up on their heads in earthenware jars—and nowadays sometimes in petrol cans.—Precisely the opposite is the case at Silat edh-Dhahr in northern Samaria, a village situated on a low spur. Its two springs are above it in a side-valley. Here the women carry the water *down* 55 and 75 m. respectively, or an additional 25 m. if they live in the lower part of the village. The distances involved are 650 or 700 m. to the upper entrance of the village and up to 400 m. more to the lower part.

*(Drawn by M. Seydewitz)*

Fig. 6. Settlements along part of the Tel Aviv-Haifa road.

Galilee consists of a series of plateaux deeply dissected by the tributaries of the Jordan. Here, of course, villages are located on the high plateaux, and none is to be found in the narrow gorge-like valleys.

The influence of security considerations on the location of villages finds an interesting illustration in the spatial relationship between villages and roads.

It is normal for roads to connect settlements. They either pass through them or touch their outer quarters. This comes about in two ways: in the oldest stage the roads connect existing settlements, leading right into them. In later stages new settlements are built along an existing road.

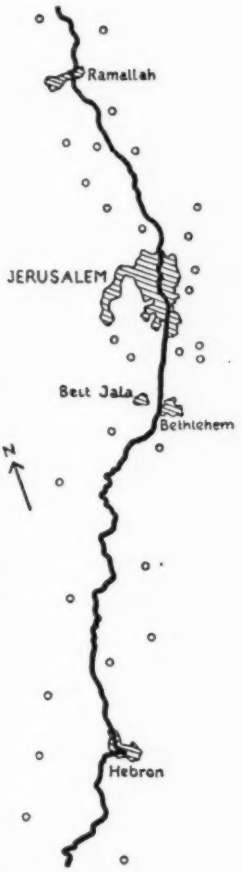
An examination of settlements and roads in Palestine shows that this relationship exists here as well (Fig. 6). But there is one notable exception to the rule: the old mountain highway from the south leading through Beersheba to Hebron, Jerusalem, Nablus and Nazareth. Whereas this highway passes *through* all the towns along its route, the overwhelming majority of the villages keep off it (Fig. 7). This becomes obvious as soon as the highway enters the Hebron Mountains, the southern sector of the Judaean Mountains. Having passed through Dhahiriyeh, which serves as a kind of frontier outpost, it does not pass through one single village on the 60 km. to Jerusalem. One string of villages keeps a safe distance from the road and is located west of it at the top of the escarpment leading down to the Shephela hills. This line includes the large village of Dura WSW of Hebron[49] and such others as Taffuh, Beit 'Ummar and the former group of Jewish villages around Kfar Etzion. A second group is removed to the east of the road, including villages like Yatta, Beni Na'im—removed farthest east—, Beit Fajjar and others. To this eastern group too belongs the village of Halhul, N of Hebron, which only during the last fifteen years grew westwards to the highway and beyond it.

With very singular exceptions we find the same relationship north of Jerusalem as far as the large plain of 'Emeq Jezreel where the road joins the old *via maris*. The exceptions are so few in number that they can be mentioned here.

[49] Cf. supra, p. 72.

Shufat on the outskirts of Jerusalem and Silat edh-Dhahr, north of Samaria, grew only recently towards the highway, the same as Halhul in the south. There thus remain only the cases of 'Ein Sinya, N of Ramallah, Huwwara, S of Nablus, Balata on the outskirts of the latter town, and Deir Sharaf at the Nablus-Jenin-Tulkarm road-fork.

There is nothing to be compared with this type of relationship along the newer roads and particularly those built during the present century (Fig.6). This again points to security—or rather lack of proper security—as the underlying reason. Throughout its long and unruly history the main mountain highway has been the steadiest highway of the country. It often was second only in importance to the coastal highway, the *via maris*. But even the *via maris* was often avoided because of the dangerous state of the country through which it led, and still more because that country had been turned barren, swampy and malarious. At such times the mountain highway, removed from invading armies and malaria and leading through inhabited country, carried much more traffic, especially insofar as the local population was concerned. Nevertheless, the ever recurrent deterioration of security made it advisable to remove village sites from the road proper.




*(Drawn by M. Seydewitz)*

Fig. 7. Settlements along part of the main mountain highroad. (Scale as in Fig. 6.)

### THE *KHIRAB* OF THE SHEPHELA

Attention has been drawn[50] to the disproportionately large number of abandoned sites of settlement in Palestine. Even a casual inspection of the relevant map (Figs. 8, 9) makes it obvious that one area is distinguished by a much larger number of such sites than any other part of the country: that is the Shephela,[51] the foothill-zone intervening between the Judaean Mountains and the coastal plain.

There are 457 abandoned sites (tells and *khirab*) in the Shephela. Whereas the Shephela comprises only 7% of the area of Palestine within the Mandatory

[50] Cf. supra, p. 68. [51] Cf. Historical Survey of the Number and Density of the Population of Ancient Palestine, in: General Council (Vaad Leumi) of the Jewish Community in Palestine: *Three Historical Memoranda*. Jerusalem, 1947. Map 4 and maps 1-5 generally.

Fig. 8. Abandoned sites of settlement, according to 1:100,000 series of Survey of Israel and to *Survey of Western Palestine*.

1—*Khirba* or tell;

2—Border-line between plains and mountains;

3—Dunes.

(By permission of the Director, Survey of Israel.)

(*Drawn by M. Seydewitz*)

boundaries north of 31° latitude, it contains 22.2% of its abandoned sites! There is no such disproportionate relation in recent villages. In 1944 there were 78 villages in the Shephela, being 7.4% of all the villages of Palestine north of 31°,[52] a relationship proportionate to the Shephela's share in the area of the country. The Shephela has more than three times as many abandoned sites as the average area of Palestine. There were 5.9 abandoned sites for every inhabited village in the Shephela in 1922, as compared with 2.6 for every village in Palestine as a whole.

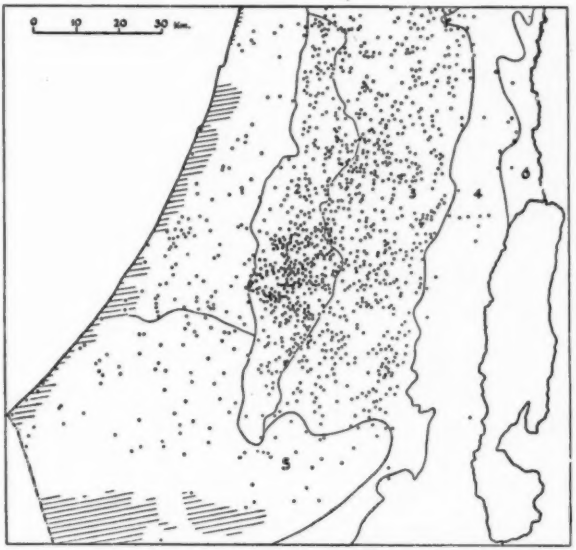



Fig. 9. Detail of Fig. 8, showing regional units: 1—Coastal Plain; 2—Shephela Hills; 3—Judaean Mountains; 4—Judaean Desert; 5—Beersheba Basin and southernmost Coastal Plain; 6—Jordan Rift Valley. *(Drawn by M. Seydewitz)*

The causes of this singularity still await detailed investigation, but certain lines of reasoning may already be advanced: The Shephela is the transitional zone, the border area, between two of the major geographic regions of the country —the Judaean Mountains and the coastal plain. As a transitional zone it was settled from the two major regions flanking it in the east and the west. The process of settlement from these two regions may have been partly alternating. It certainly was intermittent and equally often short-lived: any strain on security conditions or other basic factors influencing settlement would bring about the withdrawal of the population to the region whence they originated. The case of Dura, which had no dependent hamlet in the Shephela until after World War I and established nine such hamlets under the *pax britannica*,[53] is one of

[52] Cf. supra, p. 68.—The author is indebted to Mrs. M. Seydewitz of the Department of Geography, The Hebrew University, who compiled these figures.

[53] Cf. supra, p. 72.

many examples. The Shephela thus had a high incidence of abandonment of settlement. Situated between the two major areas it should have served as an area of refuge, of temporary retreat, for either one of them. When war, maladministration, or misrule made life miserable in the mountains or the plains—both areas which often took an active part in historical events—, or if swamps and malaria spread through the plains, a not inconsiderable part of the population would withdraw to the Shephela hills, which were a kind of backwater off the main roads. It would be only natural for a settlement-process like this to create a large number of small villages rather than large ones. When later on conditions in the home region improved, many of the emergency settlements in the Shephela would be voluntarily evacuated, the population returning to the places from which they originated.

As a border area or intermediate zone, the Shephela probably suffered more destruction than either one of the neighbouring regions. In every case of war in which the mountains and the plains were on opposite sides—there have been and still are many such cases—the two states concerned would not only carry out military actions in this border zone but would deliberately destroy its settlements in order to clear a *glacis* and create a *cordon sanitaire*.

## THE DETERIORATION OF ABANDONED SETTLEMENTS

One of the reasons increasing the number of abandoned sites should be the speed of disintegration of abandoned settlements. In this respect the results of events connected with the recent War of Liberation are most illuminating. Villages which are uninhabited for a few years only disintegrate at an amazing speed. Houses which remain without regular maintenance and repair for a few winters only develop cracks in the walls, the roofs cave in and once the rains penetrate into the house its disintegration proceeds at an accelerated speed.

There is one accessory process which certainly was operative in the past as it is at present. As houses in the Shephela are built of dressed stone, new settlers look for building material on abandoned sites, rather than quarry the supply they require. One often sees walls which have been 'peeled' of their stones and only the rubble-filling remains: this hardly survives the next two winters.

If, therefore, a new wave of settlers returned to the Shephela there was no inducement to re-occupy the old sites: they had long since disintegrated and no longer offered any special advantage. On the contrary, it is often easier to build

a settlement on a fresh site than on an old one which has first to be cleared. There is one definite lesson for archaeology from recent history: the disintegration of villages or the formation of a tell is by no means a slow and gradual process taking generations to become effective. Quite the contrary: it is a quick process taking no more than a few years.

One more reason did not urge people to re-occupy old sites in the Shephela. There is a conspicuous scarcity of springs in the Shephela as compared with other parts of the country, since the Shephela forms the central part of a synclinal region. Most villages of the Shephela obtained their water-supply from wells and cisterns, often from a large number of them. Unlike a spring, a well when left without proper maintenance often becomes unfit for use, as the walls cave in, the water often becomes contaminated, or the well may even be wantonly filled with rubble or stones. A new settler, therefore, more often than not had to dig a new well and could do so at a variety of places. He was not compelled to re-occupy an old site to ensure his water-supply, as was the settler who relied for his water-supply on a spring.

*(To be concluded)*

# HEBREW BOOKS AND PAPERS

## *Books*

S. Yeivin: *The War of Bar Kochba.* 2nd revised edition. Jerusalem: Bialik Institute, 1952. 264 pp. X Pls.

This comprehensive history of the wars of Bar Kochba has now been reissued with several additions in the light of recent discoveries. The author analyses the information scattered in ancient sources about this obscure period of Jewish history and gives a clear reconstruction of the development of the events. The book has five appendices of which the second is of particular interest containing a survey of all the documents known to date on this revolt.

*Yerušalayim*, edited by M. Ish-Shalom, M. Benayahu, A. Shohet. Jerusalem: R. Kook Foundation, 1953. 327 pp. (Dedicated to I. Press on his 75th birthday.)

This volume contains twenty-eight contributions on many aspects of the history of Palestine and of Jerusalem in particular. They are preceded by a bibliography of the writings of I. Press, distinguished veteran of Jewish Palestinology.

The following papers may be mentioned here:

B. Mazar reviews the names of the sites mentioned in the stele of Amenhotep II, which was found at Memphis some years ago and records his military campaigns in the land of Canaan; the author discusses the identification of the sites (pp. 13-20). M. Sloushz proposes identifications for names of the Palestinian sites mentioned in Phoenician inscriptions. The material is arranged in alphabetical order (pp. 21-28). B. Kanael proposes a new chronological order for the coins of Alexander Jannaeus (pp. 29-39). M. Avi-Yonah discusses the siege of Jerusalem by Titus and tries to explain why Titus attacked the city first from the west and not like other attackers from the north; in the author's opinion this was due to the fact that the wall of Agrippas, which defended the city at that time, was very strong in the north, but weak in the west (pp. 40-42). S. D. Goitein reviews the history of Jerusalem in the Arab period (638-1099) (pp. 82-103). J. W. Hirschberg describes the importance of Ramle as the midway station between Jaffa and Jerusalem in the Middle Ages and in early modern times (pp. 123-128). B. Lewis contributes interesting evidence on population and tax revenues of Palestine in the sixteenth century (pp. 133-137), whilst U. Heyd reviews the history of the Jews of Palestine in the late seventeenth century in the light of Turkish poll-tax lists (pp. 173-184). J. M. Toledano publishes two documents from Jerusalem, the first dated 1720 and the second 1760; they give important information about the conditions of the Jewish community in Jerusalem at those dates (pp. 215-219). President I. Ben-Zvi publishes certain documents on the history of the Jews in the village of Peqi'in in Galilee after the earthquake of 1837 (pp. 252-258). The concluding paper by N. Shalem deals with certain aspects of the human geography of the Judaean Desert: the Beduin, roads, and various types of settlements (pp. 300-326).

## *Papers*

### ARCHAEOLOGY

A short guide to Caesarea, containing a summary of its history and a description of its ruins, is attached to *'Alon*, 4, 1953.

### EPIGRAPHY

M. Schwabe publishes a hitherto unknown Greek sepulchral inscription of the 2nd-3rd century A.D. from 'Ubaidiye in the Jordan Valley, south of Lake Tiberias, in which mention is made of a Ἰούλιος Μαρεῖνος (*Tarbiṣ*, 19, 1948, pp. 119-122); he also studies another Greek inscription of the 6th century A.D., found in Caesarea and commemorating the foundation of a βοῦργος (*ibid.*, 20, 1949, pp. 273-283).

### TOPOGRAPHY

B. Mazar-Maisler studies the identification of two place-names, HRQM and HḤGR, mentioned in the Mišnah (Gittin 81, 41) in the light of ancient Egyptian, Graeco-Jewish and Graeco-Christian sources. The first he proposes to identify with the Nabataean kingdom (afterwards the Roman province Arabia Petraea), the capital of which was Petra; the second he identifies with the fortified area of the southern limes of Palestine; the name afterwards indicated also the limes of Provincia Arabia and the Negev (*ibid.*, pp. 316-319).

M. Avi-Yonah proposes to identify the river *Kiromion* mentioned in the Babylonian Talmud with the river Na'aman near Acre (*ibid.*, 21, 1950, p. 61).

### HISTORY

Y. Aharoni gives a synchronized table of the regnal years of the kings of Judah and Israel; he shows that the absolute number of years of the kings of Judah given in the Books of the Kings is right, and that the absolute number of years of the kings of Israel must be fixed in relation to the chronology of the kings of Judah (*ibid.*, pp. 92-100).

B. Mazar-Maisler deals with the events of the last years of Jehoram, king of Judah, referred to in 2 Chron. xxi, 12-19; in the light of Assyrian sources he tries to show that when the southern peoples invaded Judah, the king was engaged in the north in a war against Assyrians, together with the king of Israel and other allied kings (*ibid.*, 19, 1948, pp. 123-124).

Starting from a passage in 2 Maccabees iv, 9 καὶ τοὺς ἐν Ἱεροσολύμοις Ἀντιοχεῖς ἀναγράψαι, A. Tcherikover reconstructs the fundamental lines of Jason's reform of the legal status of Jerusalem, which was transformed by him into a Greek *polis* under the name of Antiochia (*ibid.*, 20, 1949, pp. 61-67).

A. Fuchs discusses some evidence concerning Alexander the Alabarch and Tiberius Iulius Alexander, the kinsmen of Philo Alexandrinus. He argues that the younger son of Alexander the Alabarch was Marcus Iulius Alexander, who is mentioned in five ostraca from Koptos as an important businessman, trading with Arab countries and India (*Zion*, N.S., 13-14, 1948-49, pp. 10-17).

I. Heinemann discusses the relationship between the Jewish people and their land in Hellenistic-Jewish literature and shows that the current conception of Ereṣ Israel as a motherland was first expressed by Hellenistic Jewry (*ibid.*, pp. 1-9).

M. Segal makes a contribution to the history of the sect *Yaḥad*, whose existence

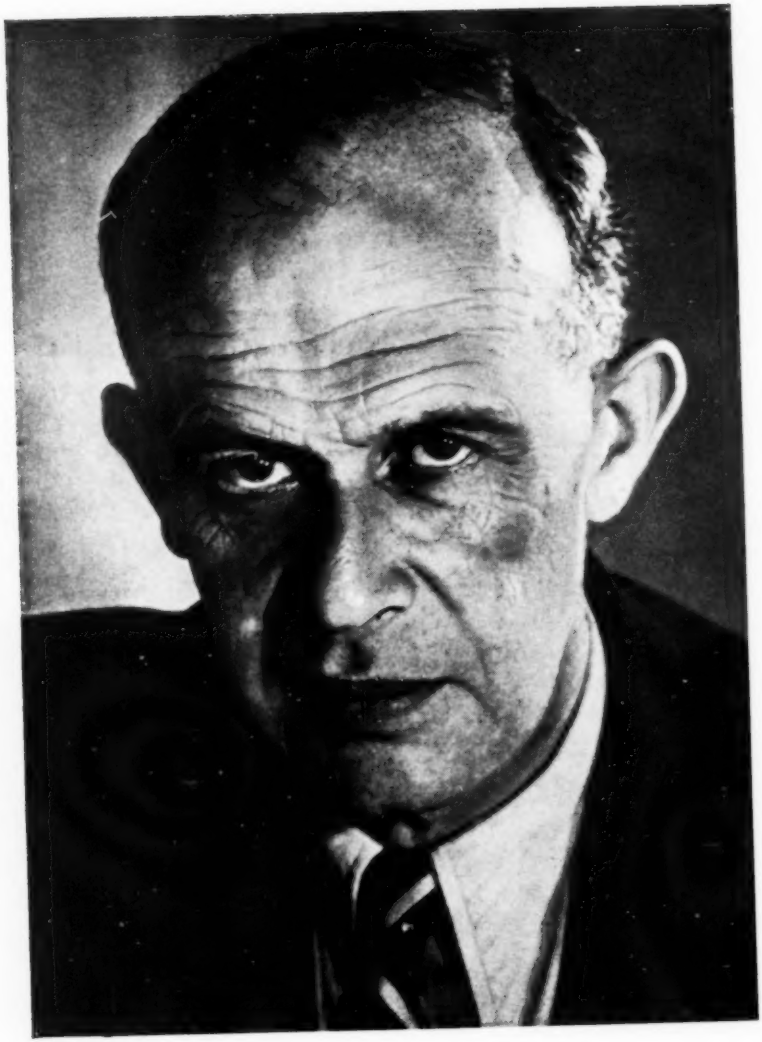
appears from the Dead Sea Scrolls, and relates it to the sect of the Zadokite Damascus document (*Tarbiṣ*, 22, 1951, pp. 136-152).

Starting from a Jewish Greek inscription found in Attica, in which mention is made of a προσχολος, M. Schwabe surveys Jewish and Graeco-Roman schools in the Mišnaic-Talmudic period (*ibid.*, 21, 1950, pp. 112-123).

A recently discovered Arabic manuscript in Jerusalem is identified by S.D. Goitein as the book of Ibn 'Ubbayya, the Kadi who was involved in the destruction of the Synagogue of Jerusalem in 1474. The book is a very valuable source for the history of Jews and Christians in the Orient, especially in Jerusalem, at the end of the Middle Ages (*Zion*, N.S., 13-14, 1948-49, pp. 18-32).

### CLIMATOLOGY

N. Rosenan reports on *Climatological Researches in Cloud Seeding in 1951-52* (Israel Meteorol. Serv., Meteorol. Circular, 1953, 4 pp., map). These experiments continued those of 1950-51 (cf. D. Zahavy, ed.: *Symposium on Artificial Rain*. Israel, Ministry of Agriculture, ha-Qirya, 1951) and brought about much more substantial results. Between September 1951 and May 1952 twenty-six experiments in the induction of artificial rain were carried out in northern Israel, eighteen of which were subjected to detailed climatological analysis. In these experiments silver iodide was released from ground generators at two stations, one near the coast, the other in the mountains of Galilee. Of the eighteen days analyzed thirteen produced over 10 mm. of rainfall each, four amounts less than 10 mm. and only one day remained rainless. The map shows that a considerable part of the area dealt with received in the eighteen days analyzed between 15 and 23% of the total rainfall recorded at these stations during the year 1951-52.



PROFESSOR A. REIFENBERG

1899-1953